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ABSTRACT

The inservice training package for teachers of severely and profoundly handicapped children consists of six field tested modules. Each module consists of the following components: objectives (general and specific), instructional methodology, instructor materials (lecture notes and transparencies), participant materials (worksheets and handouts), pre- and posttests with answer keys, and a bibliography. Presented are the following modules (subtopics in parentheses): systematic instruction (assessment techniques, task analysis, individualized education programs); curriculum (motor, self-help, communication, cognition, play, socialization, and vocational areas); behavior management (accelerating behavior, developing new behavior, decreasing undesirable behavior, transfering and maintaining behavior); physical management (positioning, transfers, management of equipment, self care for the cerebral palsied); parent/professional involvement (family training, community resources, legal rights and due process, paraprofessional training); and health management (health care needs, basic life support, dental care, and emergency care). (CL)

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Preparation of Personnel

To Serve The

Severely and Profoundly Handicapped

State of Iowa
DEPARTMENT OF PUBLIC INSTRUCTION
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Preparation of Personnel to Serve
The Severely and Profoundly Handicapped

Inservice training performs an increasingly important function in education. This is particularly true in the field of special education for the severely and profoundly handicapped. Because of the extensive knowledge and skills required to help severely and profoundly handicapped children (Sailor & Haring, 1977), teachers of severely and profoundly handicapped students require either intensive preservice training (Brown & York, 1974; Wilcox-Cole, 1977), or extensive retraining to learn the skills they need to work with such students.

It is apparent to many involved in personnel preparation that preservice training programs are only a partial solution to the problem of training teachers to deal with the severely and profoundly handicapped. Universities are developing long-term training programs, but those teachers who are already faced with meeting the educational needs of severely and profoundly handicapped children must receive the necessary training through systematic inservice training programs.

In response to this critical need the State of Iowa has designed and developed an inservice training program. During this program an inservice training package consisting of six comprehensive training modules was developed and field-tested. The primary goal of this package is to provide a vehicle through which knowledge and skill competencies with the severely and profoundly handicapped may be acquired and applied in order to insure the provision of appropriate services to severely and profoundly handicapped children and their families. This package and individual modules are designed for teachers, paraprofessionals and other personnel who work with the severely and profoundly handicapped.

Upon completion of the inservice training package, individuals should be able to:

perform initial assessment

select and prioritize long-term learning goals

write appropriate short-term behavioral and measurable learning objectives

plan and implement an instructional program using selected curriculum, instructional procedures and consequences

select and apply appropriate ongoing measurement techniques

utilize collected information for program modification and interventions

select and/or design performance indicators and measurement devices for summative assessment (overall evaluation)

The inservice training package consists of six field-tested modules. These include Systematic Instruction, Curriculum, Behavior Management, Physical Management, Health Management, and Parent Professional Partnerships.

Each module consists of the following components:

- Table of Contents
- Module Overview
- Objectives

- General
- Specific
- Instructional Methodology
- Instructor Materials
  - Lecture notes
  - Transparencies
- Participant Materials
  - Worksheets
  - Handouts
- Pre and Post-Tests with Keys
- Bibliography

Estimated time frames for each activity within each module have been added for your information. However, do not feel bound by these time estimations. The times will vary according to the amount of materials you choose to include in training. For example, depending on the participants, which are being trained, more field work might be appropriate; there may be less need for articles and other didactic materials. On the other hand, you should find the articles an excellent means of preparing for class discussion.

A suggested order in which to present the modules would be: 1) Systematic Instruction, 2) Curriculum, 3) Behavior Management, 4) Physical Management, 5) Parent/Professional Partnerships, and 6) Health Management. However, based on time and needs of the participants the sequence can be modified. When time is a critical factor, modules can be presented independently. However you choose to present the modules, be sure to base your decision on *needs assessment* data. Assessment of entry level skills of inservice participants is essential in order to know what skills and knowledge they possess, so one can plan what material should be covered in lectures and what types of training activities should be provided in the practicum.

Iowa's inservice model calls for five continuous weeks of classes with mornings devoted to practicum experiences and afternoons to didactic presentations. Whatever inservice model you decide upon, it is imperative that inservice participants demonstrate knowledge and skill competencies under supervision in a practicum experience. Having a practicum experience gives the participants a chance to combine what they learn from didactic presentations, hand-outs and readings with actual "hands-on" experiences.

Inservice instructors should have direct experience with the severely and profoundly handicapped. Much of the information is very specialized and should be presented by a person with experience in the area. As a caution, if the appropriate specialist cannot be found, it may be better to wait, and not present the material until such an individual can be located.

Instructors are encouraged to supplement the existing materials with materials of their own. Examples from practical experience should be added to make the content more pertinent to the audience.

Previous experience with the modules indicates that lecture should be kept to a minimum. Here are some general rules which should be considered:

1. Keep lectures short - 60 to 75 minutes at most with a break.

2. Never assume the concept is understood just because no one asks a question; drill the point home in a variety of ways.

3. Use many examples to highlight major points.

4. Have people get involved in learning a concept: role-playing and case studies are good for this.

5. Utilize video-tapes, films and slides whenever possible. They are a big asset.

6. Use outside speakers; if possible rotate your presentation with others. This makes it easier for participants.

Finally, remember it is better to not answer questions that you don't know. Simply respond "I don't know, but I will find out". Then get back to the person as soon as possible. Also, be prepared by thoroughly familiarizing yourself with the module materials. Don't use terms or jargon that you don't understand.

We hope this brief description of how to use the entire inservice training package as well as individual modules will assist you in your inservice efforts.

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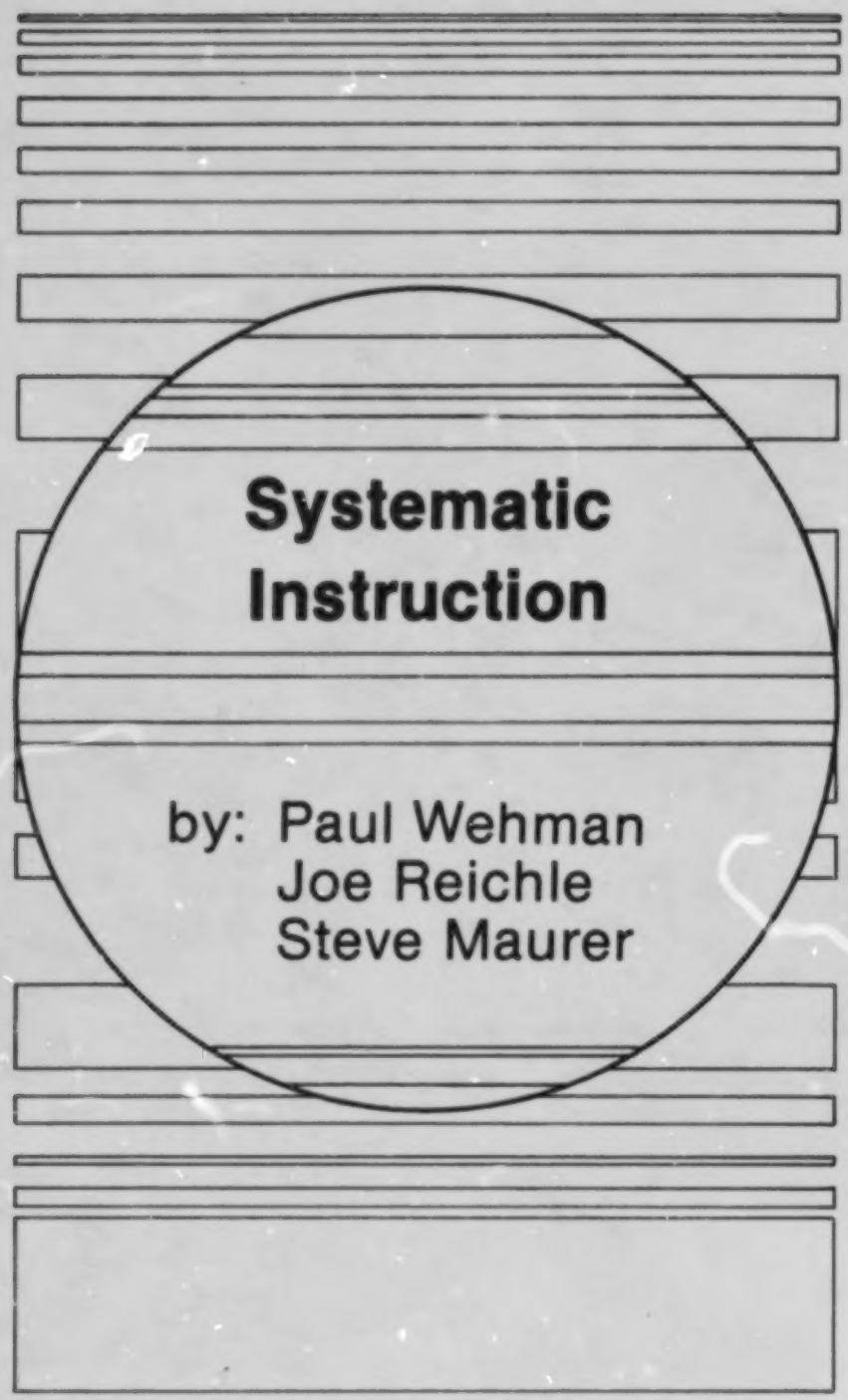
Systematic
Instruction
by: Paul Wehman
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Overview

The purpose of this module is to describe the program development sequence required to teach severely and profoundly handicapped learners. It includes assessment techniques, setting objectives task analysis, instructional procedures, program evaluation and writing an Individualized Education Plan (IEP). When the participant completes this module he or she will be able to understand the systematic instruction process necessary for teaching severely and profoundly handicapped students.

This module reflects the importance of a systematic approach to instruction of severely handicapped students. It is based on principles of learning, especially operant and discrimination learning. The information provided within this module is current and reflects what is considered by many today to be the best methods of teaching severely and profoundly handicapped individuals.

As a major requirement for successful completion of this module, each participant must write an instructional program. The purpose of this requirement is to blend the didactic presentations hand-outs, and readings with actual "hands-on" experiences.

Instructional program criteria have been provided, as well as a sample instructional program for instructor and participant review. The instructor may wish to establish deadlines for drafts of the various parts of the instructional program which correspond to completion of module subsections so that ample time for review of these drafts can take place. In this way a type of errorless learning will occur and participant failure will be minimized.

This module has been devised so that it may be used independent of other modules in the inservice program sequence. However, when used with an inservice plan which calls for a combination of practica and didactic it will be best to teach this module first. The number of articles and readings in this module can be reduced in order to shorten the length of time required for completion. All components of the systematic instruction process must be covered in order for the information to be presented in the appropriate context.

Objectives

General Objectives

1. The participant will understand the basic program development sequence involved in systematic instruction.

2. The participant will describe the role of assessment and behavior observation in the systematic instruction process.

3. The participant will describe the critical aspects of setting annual goals and short-term objectives in instructional programs.

4. The participant will understand the implications of task analysis in the assessment, instruction, and evaluative components of systematic instruction.

5. The participant will describe various modes of evaluating child progress in instructional programs.

6. The participant will be familiar with the purpose of Individual Education Plans (IEP) and develop the skills necessary for completing an IEP.

Specific Objectives: Assessment

1. The participant will explain why initial assessment is critical to program development.

2. The participant will describe the strengths and weaknesses of selected standardized and nonstandardized tests with a severely/profoundly handicapped population.

3. The participant will discuss the importance of reliability and validity in conducting selected assessments.

4. The participant will describe how to pinpoint entry and exit level skills through task analytic assessment.

5. The participant will compare and contrast the value of elicited assessment, observational assessment, and interview assessment.

6. The participant will conduct initial assessment with a severely and profoundly handicapped child in the practicum setting.

Specific Objectives: Observation

7. The participant will describe how to collect frequency or rate data of discrete behaviors.

8. The participant will describe how to collect time-sampling data through interval recording.

9. The participant will identify the advantages and disadvantages of continuous versus probe data.

10. The participant will understand the use of data as a program decision tool for monitoring and evaluation of child progress; the participant will also be able to graph data correctly.

Specific Objectives: Behavioral Objectives

11. The participant will describe the purpose and function of the three components of a behavioral objective.

12. The participant will describe the purpose and rationale for prioritizing short and long term objectives for students particularly in relation to the child's criterion of ultimate functioning.

13. The participant will write behavioral objectives in a minimum of three curriculum areas.

Specific Objectives: Task Analysis and Skill Sequencing

14. The participant will describe four advantages to task analytic instruction.

15. The participant will describe the basic steps involved in breaking down a behavior into small components.

16. The participant will identify several sources of task analysis sequences (i.e., child development tests, curriculum guides, etc.).

17. The participant will task analyze a minimum of three skills across different curricula domains.

18. The participant will develop a series of task analyses which lead into a relevant skill sequence for an instructional program.

Specific Objectives: Instructional Procedures

19. The participant will describe how tenets of discrimination learning such as easy-to-hard sequencing, stimulus fading, cue redundancy and color coding may be applied to acquisition of skills.

20. The participant will describe how tenets of reinforcement theory such as scheduling, timing, and reinforcer selection can strengthen and maintain new behavior.

21. The participant will describe how behavior shaping techniques such as instructions, modeling, chaining, prompting, and fading can be used to develop new behavior.

22. The participant will describe how to program for retention and transfer of training through overlearning, selection of meaningful content, varying stimulus conditions, and gradually fading reinforcement contingencies.

Specific Objectives: Program Evaluation

23. The participant will list and define four program evaluation designs.

24. The participant will design a system of reporting pupil performance to parents and administrators.

Specific Objectives: Individualized Education Program (IEP)

25. The participant will list in writing the nine major components of an IEP and describe each one.

Materials

Instructor materials

- blank transparencies
- overhead projector
- pens
- index cards
- blackboard
- chalk
- transparencies 1-62

Participant materials

-two copies of pre/post test per participant
-graph paper
-rulers
-handouts 1-17 - one per participant
-worksheets 1-8 - one per participant

Methodology

Time	Introduction
15 minutes	Pretest
15 minutes	1. Using Introduction to Systematic Instruction Module (Lecture Notes No. 1), the instructor will hand out Behavioral Terminology sheets (Handout No. 1) to participants. The Bibliography is also handed out at this time.
30 minutes	2. The instructor will discuss the Systematic Instruction Process using Lecture Notes No. 2 and Transparencies No. 1 2, and 3. Handout No. 2 "Introduction to Systematic Instruction" and Handout No. 3 "Components of an Instructional Program" should be given to the participants now.
	Assessment
30 minutes	3. The instructor will discuss the purpose and importance of initial assessment: the difference between assessment and intervention should be emphasized and various assessment techniques should be discussed (Lecture Notes No. 3 and Transparencies 4 9). Handout No. 4 "Task Analytic Assessment of Severe Learning Problems" should be passed out to participants.
90 minutes	4. The instructor will conduct an activity (Lecture Notes No. 4) where participants are divided into dyads and given a "Test Analysis Form" (Worksheet No. 1). The participants will analyze selected standardized and non-standardized tests which may be used with the severely and profoundly handicapped. After the groups analyze these instruments they will present their analyses to the large group.
	5. The participants will receive Handout No. 5 - "Kansas State Department of Education List on Assessment Tools for the Severely Handicapped." It is suggested that the instructor consult this list in deciding which tests would be most appropriate to analyze. The number of tests chosen will vary depending upon the number of participants in the workshop. It is recommended that at least 10 instruments be analyzed.
30 minutes	6. The instructor will discuss conducting a task analytic assessment using Transparency No. 10.
	Observation
180 minutes	7. The instructor will provide an overview of data collection procedures using Lecture Notes No. 5, Transparencies No. 11-14 and Handouts No. 6-11. The handouts should be distributed to participants during appropriate parts of the lecture. How to collect time-sampling techniques should be described along with illustrations of relevant situations for which time-sampling can be utilized. The instructor should discuss advantages and disadvantages of continuous versus probe data. Handout No. 12 "Continuous Measurement of Progress in Infant Intervention Programs" will be distributed to participants at this time.

120 minutes

8. The instructor will present Lecture Notes No. 6 and will show Transparencies 15-17 of data which has been graphed. The instructor should then demonstrate graphing of data on the overhead for participants. All participants will then be given a set of data to graph (Worksheets 2-5).

Behavioral Objectives

Handout No. 13 "Criterion of Ultimate Functioning" should be distributed to participants to be read prior to the lecture and activities.

60 minutes

9. The instructor, using Lecture Notes No. 7 and Transparencies No. 18-21, will describe the purpose and rationale behind the three components of a behavioral objective. The instructor should describe the difference between goals and objectives and should emphasize the importance of formulating realistic goals which are commensurate with the child's curriculum priorities and needs

30 minutes

10. The instructor, using Lecture Notes No. 8 and Transparency No. 22, will describe an activity (Worksheet No. 6) where participants write a goal and several objectives for a specific individual. The participants will complete the activity in trios.

20 minutes

11. The instructor will divide the participants into small groups to write behavioral objectives (Worksheet No. 7) which they will then share with the large group.

Sequencing

Handout No. 14 "Procedures of Task Analysis" should be distributed to participants prior to the lecture.

60 minutes

12. Using Lecture Notes No. 9 and Transparencies No. 23-26 the instructor will describe what a task analysis and skill sequence is. The instructor should list several advantages of using the task analytic method, then describe where task analysis sequences can be found. The instructor will describe the purpose and rationale behind clustering related task analyses into a skill sequence. The importance of sequencing should be emphasized.

30 minutes

13. Using Lecture Notes No. 9, the instructor will describe the steps to use in breaking down a behavior. The instructor will then show a minimum of five task analyses on the overhead (Transparencies No. 27-37).

60 minutes

14. The participants will be divided into pairs and given selected behaviors to task analyze (Lecture Notes No. 10).

Teaching Procedures

Handout No. 15 "Training Proficiency Scale" and Handout No. 16 "Discrimination Learning" should be distributed prior to the lecture.

60 minutes

15. The instructor will discuss the teaching model which reflects cue hierarchy sequence (Transparency No. 38).

120 minutes

16. The instructor will discuss reinforcement procedures (Lecture Notes No. 11, Section I and II; and Transparencies No. 39-45).

10 minutes

17. The instructor will discuss shaping procedures (Lecture Notes No. 11, Section III).

15 minutes	18. The instructor will discuss chaining procedures (Lecture Notes No. 11, Section IV and Transparency No. 46).
20 minutes	19. The instructor will discuss fading procedures (Lecture Notes No. 11, Section V, and Transparency No. 47).
30 minutes	20. The instructor will discuss correction procedures (Lecture Notes No. 11, Section VI).
20 minutes	21. The instructor will discuss stimulus control procedures (Lecture Notes No. 11, Section VII, and Transparencies No. 48-49).
20 minutes	22. The instructor will discuss verbal and motor imitation training procedures (Lecture Notes No. 11, Section VIII).
10 minutes	23. The instructor will discuss sequencing instructional activities (Lecture Notes No. 11, Section IX and Transparency No. 50).
25 minutes	24. The instructor will discuss selecting the proper training technique and writing a program (Lecture Notes No. 11, Section X).
20 minutes	25. The instructor will discuss transfer of training (Lecture Notes No. 11, Section XI).
30 minutes	26. The instructor will review the components of the "Training Proficiency Scale" (Handout No. 15) with participants.
60 minutes	27. The instructor will have each participant complete Worksheet No. 8. Discussion will follow upon completion of the activity.

Program Evaluation

60 minutes	28. Using Lecture Notes No. 12, the instructor will discuss the various modes of program evaluation (pre and post tests, trials to criterion, errors to criterion, changing criterion design multiple baseline). The instructor will present transparencies of each design (Transparencies No. 51-61).
30 minutes	29. The instructor will elicit discussion from participants on the types of "report card" formats they use.
45 minutes	30. The instructor will have the participants break into dyads. Once participants are in their groups, each group should design a "report card" for reporting pupil performance to parents and administrators.

Individual Education Plans (IEP)

60 minutes	31. The instructor will discuss the development of an Individual Education Plan (Lecture Notes No. 13 and Transparency No. 62). Handout No. 17 "Individual Education Plans" should then be distributed to participants.
15 minutes	Post test

Suggested time for completion of module: approximately 24 hours.

INTRODUCTION

This module will not only familiarize you with the components in the systematic process, but it will give you many experiences to practice using these skills in planning a program.

This module addresses the following components in planning a program:

1. Assessment techniques
2. Setting objectives
3. Task analysis
4. Instructional procedures
5. Program evaluation
6. Writing an IEP

A number of activities have been designed for you to actively participate in this process. It will be vital for you to become involved and work with one another in refining your skills. Some of you may have some well developed skills in writing objectives or in completing a task analysis. If this is the case, then you can be of assistance in small group activities in directing those who may not demonstrate these strengths. This will be a great opportunity for you to utilize your competencies and to get feedback from one another in developing your programs.

This module lays the foundation for all program planning you will be designing, not only in this workshop, but when you are out in the field as well. Take advantage of this opportunity and you will have accomplished a great deal in developing your programming skills.

Valerie Lynch
Corrine McGuigan
Sue Shoemaker

SYSTEMATIC INSTRUCTION

Defining the Good Teacher

What is "good teaching"? Perhaps most of you recall several teachers that you considered excellent. What did these teachers have in common?

Probably a teacher you considered to be "good" taught a subject that you liked or one in which you performed well. It seems only natural that in classes where children perform well, they receive positive attention for their work from the teacher, peers, or parents and/or delight in the knowledge that they are good pupils. Such attention and positive feelings can easily be translated into regard for the teacher as excellent or for the subject matter as fascinating.

But what about the class in which you did not perform well, but did consider the teacher to be a good one? The teacher of that class probably made you feel that the information you were learning was meaningful and that you were doing a good job, even though you weren't the "star pupil".

A common trait of "good teachers" might well be stated as "the ability to recognize that a pupil is performing to the best of his or her ability, to communicate approval of this effort, and to encourage continuance of such effort." While not all teachers are destined for "stardom" in the field of education, it seems highly possible to provide teachers with the skills necessary to become good teachers as we've defined it, that is, to provide for each pupil a learning environment which leads to optimal performance.

It is easy to visualize being a good teacher for pupils who are interested, capable, communicative, and enthusiastic but difficult to imagine it for those who are indifferent or slow, who have been labeled "problem children," or who are severely, profoundly, or multiply handicapped. Yet legislation, parental pressure, and professional standards dictate that administrators and teachers provide for each pupil the educational competencies which lead to optimal performance by each child.

Good Teaching: The Systematic Approach

The purpose of this lecture is to introduce a process which provides teachers with a systematic approach to the education of pupils —— one which attempts to ensure that teachers are providing relevant educational experiences for their pupils and that pupils are performing to the best of their abilities. This process is known as systematic instruction, the systematic instructional process, or the systematic instructional model.

Over the years various curricula and instructional methods have been introduced to meet the educational needs of both teachers and pupils. While some methods and materials have proved highly successful for large numbers of pupils, none have proved successful for all children. Slowly, there has emerged a recognition that individual pupils vary according to: (1) the amount of time which they need to acquire skills, (2) the methods by which they most readily acquire and retain skills, and (3) the readiness they demonstrate in acquiring new skills at different ages. Therefore, to ensure optimal educational opportunity for pupils, any system adopted by educational personnel should allow flexibility to meet the unique learning characteristics of pupils. Thus, educational practices must be viewed as a part of the total educational environment which reflects good teaching *and* meaningful learning.

Defining Systematic Instruction

Systematic instruction is a procedure designed to create an optimal learning environment. It is a *process* in which teachers follow a set of guidelines that direct their teaching activities regardless of specific curricula or techniques. Probably the most profitable way of finding out just what constitutes systematic instruction is to forget all the words and phrases you have hitherto associated with it. Start

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thinking of systematic instruction as a *process* —— a process which directs the optimal functioning of a learning environment.

Unlike models which focus on abstract theories or hierarchies not directly related to classroom instructions, in this lecture systematic instruction is a process which teachers and administrators can comprehend *and utilize*. Systematic instruction is the utilization of practices such as proper assessment and accurate programming. We have attached labels to components of the process for identification and communication purposes. Focus your attention on the function of each component as opposed to the label. As you do so, you may find that you are currently incorporating many aspects of systematic instruction. Likewise, you may encounter others, using different terminology, who describe and support the same process.

Stages in the Systematic Instructional Process

Whatever the terminology, the systematic process should include these stages: (1) assessment of general and specific skills; (2) establishment of long term objectives or goals for each skill area or behavior of concern; (3) establishment and sequencing of short term objectives (steps leading to each long term objective); (4) development and writing of an instructional plan; (5) development and writing of measurement procedures for each behavior; (6) implementation of the instructional plan and measurement procedures; (7) modification of the plan based on data; and (8) evaluation of overall pupil progress. By "teaching through these stages" educators create and participate in systematic instruction. In the beginning and in the end, they optimize the learning environment for each pupil. At the same time, parents and administrators are provided precise statements of educational objectives and accurate and meaningful documentation of each learner's progress toward these objectives. In this age of federal grants, state regulations, and parental concern for quality education, this documentation provides an accountability system.

Components of the Systematic Instructional Process
(refer to Transparencies No. 1, 2, 3)

In the following section the significant function and inter-relatedness of each component is briefly described. This should help you understand the process when you hear it referred to by different names.

Assess. Initial assessment, or finding out just what it is a child can or cannot do, is the first task to be completed by a teacher who desires to develop relevant educational experiences for his or her pupils. Obviously, good teaching implies teaching what needs to be learned —— not just placing each learner in the first chapter of a predetermined text or the first step in a predetermined curriculum. Initial assessment means contacting persons (previous teachers, other involved professionals and parents) and reading records to find out as much about a learner as possible. It means administering formal tests (diagnostic or developmental) when available scores on such tests are out-dated or invalid. Initial assessment likewise means administering teacher-made tests, specific skill tests or sequence-related tests to determine precise levels and conditions of learning for each student. And last, but surely important, is the need for the teacher to spend some time meaningfully observing the behavior of the student. Through personal contact with former teachers or through school records, a teacher might learn that a pupil daydreams a lot or exhibits no head control. However, this is not relevant to classroom programming. Through meaningful observation, specific information such as, "the pupil continually leaves his/her seat to stare out the window during math" or "the pupil can maintain head control for two seconds" can be collected. This information is pertinent in planning programs for the learner.

Establish Long Term Objectives. Once a teacher has gathered general information and precise data on what a child can do, the teacher should compile this assessment information and use it to write long term goals or objectives. To be relevant to the development of classroom programs, long term objectives must be written to include the learner, the desired behaviors for the academic year, the conditions under which the learning will occur, and the criteria for success. The importance of this step cannot be overstated. As difficult as long term objectives are to write, they provide the teacher,

the parents, and the administrator, and, in some cases, the learner with specific and concrete statements of what skills a child should have at the end of nine months.

Consider taking a trip. Contrast the difference between taking a trip having specified your destination and taking a trip with no special goal in mind. Without a goal you know neither which direction to go nor how fast to travel; having established a goal you know both these facts (head south and really hustle). With this information you can judge whether or not the direction and the rate at which you are traveling will get you to your final destination.

It all depends on where you are, where you want to go, and when you want to get there. In teaching, initial assessment information tells you where you are, while long term objectives identify where you're going and when you plan to arrive. These two bits of data tell you a good deal about how fast you need to travel, and help you to set intermediate goals or short term objectives. In summary, long term objectives identify important areas for educational programming and help teachers focus on the needs of the learner.

Establish Short Term Objectives. Sequencing approximations toward long term objectives —— or the establishment of short term objectives —— is the next step in the process. Writing and sequencing short term objectives outline the steps and procedures which lead to attainment of the long term goals. Usually it is advisable to write short term objectives for short periods of time —— anywhere from one week to three month periods —— and to write them in *precise, behavioral* terms specifying the learner, the exact behavior, the conditions under which the behavior will occur,and the criterion for success.

By teaching to a series of short term objectives, teachers are more likely to proceed systematically and are less likely to engage in random instruction. Again, by writing very specific objectives for short periods of time, everyone involved with the learner (and for a higher functioning pupil — the learner him/herself) has a good idea of what needs to be learned. Because short term objectives include specific criteria for success, the teacher will also know if and when information or skills are learned.

Develop and Write an Instructional Plan. The fourth step in the process is the development of an instructional plan directly related to each short term objective. This step is designed to ensure that each pupil proceeds from "where s/he is now" to the successful attainment of each short term objective. Several major areas of decision-making are incorporated in this step. These are the selection and specification of: (1) curriculum, (2) instructional procedures, and (3) reinforcement.

Choosing appropriate and functional instructional materials is not an easy job. Most importantly, it means ensuring that the content of materials matches that of the objectives specified for the pupil. It means knowing what materials are available in the school and district, how much money is available for purchase of new materials, and the local school district's most recent policy for ordering materials. It means having the skills to create specific materials or a curricular sequence when none are available and to modify existing ones to meet specific pupil needs. Teachers and administrators also need curriculum evaluation skills; most significantly, they need to know what materials can be used or developed to meet specified objectives.

Now having selected exactly what it is you will teach, how are you going to deliver instruction? What tactics or procedures will most contribute to learning for each pupil? The selection of appropriate instructional procedures is as important to the systematic plan as the selection of materials. Instructional procedures include specifying what the teacher or pupil will do prior to exhibiting the desired behavior. For example, drill, demonstration and physical assistance to completion of the desired behavioral sequence are common instructional tactics. Instructional procedures also include those tactics to facilitate learning which occur following a behavior. Correction procedures, error drill, and immediate feedback on performance are common examples. Important to remember in the choice of instructional procedures is the fact that not all pupils respond equally well to the same procedures. It is critical to observe each pupil in order to determine the effectiveness of the procedures you have chosen and to change those instructional procedures which do not facilitate learning.

The appropriate selection of reinforcement can significantly increase learning and, therefore, requires careful consideration by the teacher. However, all too often we forget that what is reinforcing to us (e.g., chocolate chip mint ice cream, a pay check, chocolate chip mint ice cream, words of praise from the principal, chocolate chip mint ice cream, etc.) may not be reinforcing to our pupils.

Reinforcement is defined as an event which immediately follows a response and increases the probability that the response will occur again. Only if this pattern emerges with an individual pupil can we say that the consequent event is reinforcing.

The development and writing of an instructional plan is designed to provide the teacher with a systematic way of viewing and describing the critical variables within a particular teaching plan. By systematically planning a program and recording all crucial elements in the program, the teacher is not only familiar with each variable of the present program, but is also able to make relevant decisions about program changes if the desired objective is not being achieved. Specification of the instructional program also permits others to understand exactly what the pupil is expected to do, how the work is presented to the pupil, and the educator's responsibilities for the program.

Random slection of curriculum, instructional procedures, and/or reinforcement results in random instruction —— random learning. Successful completion of the first three steps in the systematic instructional model facilitates the implementation of this fourth step. Through initial assessment, the teacher discovers what the learner can do and what s/he can't do. Based on this information, the teacher writes appropriate long and short term objectives. Having completed these steps, it is significantly easier to develop and write an instructional plan relevant to the learning needs of each pupil.

Develop and Write Measurement Procedures. The development and specification of appropriate measurement procedures mean that for every objective written, whether it be long or short term, there must be a measurement system for showing whether the pupil is reaching that objective. Notice the wording: *reaching* rather than *reached*. Measurement must be present tense, not past tense. To be useful for a teacher, a measurement system should follow the learner's progress from the time the program is implemented to attainment of the objective. The measurement system should provide the teacher with continuous information so that if a pupil is having difficulty on a task, program changes can be made immediately. Recall the old saying, "Don't wait until the horse is stolen to shut the barn door." If a teacher waits until the end of a unit of instruction to measure a pupil's progress, it may already be too late to avoid failure. Then it is a matter of remedial work to bring the pupil up to mastery; meanwhile, there is new learning that should be taking place.

Establishing measurement procedures does not have to be complicated or costly. In many cases, a simple graph of daily scores will provide adequate information; in a few cases more elaborate systems will be required. But whatever type of system is used, it must provide you with this information: Is the learner nearing the established objective? Is the learner regressing or having more problems than success? Is the learner stagnating or showing no growth over a period of days?

A secondary function of measurement procedures is accountability. By showing the teacher how the learner is doing, measurement indicates to the teacher much about the effectiveness of his or her teaching; it gives parents information about the daily or weekly progress of their child; and it informs school principals and district superintendents about the quality of service being provided to the pupils they serve. The same information can be used to tell learners of their progress toward objectives. It can encourage them to become more responsible for their learning behavior.

Implement the Instructional Plan and Measurement Procedures. Now comes the test —— implementing instruction and measurement procedures. This step serves to check the procedures specified in steps four and five: it is the culmination of all your activities to this point. As you implement the procedures and practices you have so carefully worked out, consider the following questions: (1) Does the written instructional plan include all variables critical to the delivery of the program? and (2) Do the measurement procedures you specified provide information about the pupil's progress? If these questions can be answered with a resounding "yes," your pupil is on the road to a successful learning experience.

Modify the Plan Based on Data. Step seven is the selection and presentation of appropriate interventions. After a teacher collects several days of data, he or she will be able to decide if the learner is performing successfully in the program. If the data reveal that progress is satisfactory, no change or intervention need be made in the established program. However, should the learner be failing with the task or progressing too slowly, it is the responsibility of the teacher to alter the program so that the learner succeeds. If, for example, a pupil's daily data indicate that s/he is continually doing poorly on his/her math assignment, the teacher may choose to intervene —— or

make a change in the program — by doing one of several things. The teacher could add more practice time or add additional practice for errors only; he or she could give the pupil an aid, such as an abacus, or make free time dependent on improved math performance. For a "shirt on" program where the data indicate lack of progress the teacher may choose to use an oversized shirt to initially teach the skill. There are many options. These are called instructional interventions and are crucial elements of quality instruction. Without appropriate interventions, good pupils lose valuable learning time and poor pupils continue to fail; with it, every child advances toward his or her own goals successfully.

Evaluate Overall Progress. As in every good and successful program, the last component in the systematic instructional model is the periodic evaluation of overall progress. Continual reassessment of children's performance will keep teachers informed about retention of information and skills. Also, classroom teachers can use retention or maintenance checks to determine how well a child is using learned information and skills in varied or new situations and settings. This information can then be placed in the child's records for the next teacher to review.

Thus, the process is complete with each component serving a vital function within itself and providing continuity and purpose to the whole.

Summary of Steps in Systematic Instruction Process

As can be seen, systematic instruction cannot be readily implemented. To ensure success, both teachers and administrators must:

(1) recognize that appropriate education requires meeting the needs of individual pupils;
(2) recognize that systematic instruction is a process rather than a prescription for the education of children. It provides the guidelines for approaching the education of children, allowing leeway for a variety of teaching styles and content;
(3) recognize that each step included under the heading systematic instruction is necessary for the achievement of an appropriate educational environment for children. Disregard for any one step will significantly decrease the effectiveness of the model and diminish the quality of educational services provided;
(4) be willing to critically analyze and assess their present approach(es) to meeting pupils' needs; and
(5) be willing to devote the time and effort necessary for the implementation of systematic instruction. Initially, the cost will be high. However, as teachers become familiar with the procedures, develop the necessary skills for each of the steps, and observe the efficient and effective learning environment they have created, the results will be impressive.

The purpose of assessment is to find out the child's appropriate level of functioning: teaching a skill at too high a level will result in failure and teaching a skill at too low a level will result in boredom by the child.

Initial assessment, or finding out just what it is a child can or cannot do, is the first task to be completed by a teacher who desires to develop relevant experiences for his or her pupils.

Intervention, as opposed to assessment, consists of instructional procedures or materials which influence the child's learning. Intervention follows assessment; it's what the teacher does based on the results of assessment techniques. Intervention includes the programs, techniques, circumstances or changes implemented in hopes of producing a behavior change.

Eight methods can be used by teachers to collect information about a child and his or her environmental circumstances. Following are descriptions of the methods and some comments regarding their usefulness.

1. *Inspection of previously collected data* is the perusal of data contained in the child's record files. It is important to recognize that there are usually several files for any particular child, and each may contain information worthy of collection (though it may be spotty or incomplete). A review of available resources will provide clues concerning the possible locations of these files.

2. *Informal consultation* may be used with resources who know things about the child that the teacher does not know. Although there is no concerted effort to prepare for informal consultation and the information is not systematically obtained with a clear-cut guideline in mind, consultation may still yield valuable results (e.g., clues for further assessment). The method requires little time, but the accuracy of the information must be held suspect without additional support.

3. *Structured interviews* may be used to gather information about the child's areas of difficulty and determining what resources have previously collected information. Advance planning with respect to the purpose and guidelines of the interview is the main key to the effective use of the method. One must decide prior to an interview what specific information is needed in order to design a program for a pupil. Irrelevant or redundant questions can offend parents, teachers, etc. One should also be certain the information was not already listed in a pupil file or some other source. State why the information is pertinent and how it can be helpful in planning for the child. Structured interviews require relatively little time, but the data obtained is only as good as the teacher's ability to ask the right questions and the resource's ability to provide helpful answers.

4. *Screening devices,* in the form of questionnaires, rating scales, checklists, and inventories, comprise the last of the "quick and dirty" assessment methods (i.e., methods that gather data in a hurry, almost invariably through report). As with the previous methods, screening devices are efficient instruments, but the accuracy of the estimate may vary widely depending on the respondent's skill in rating as well as the reliability and validity of the device itself.

5. *Standardized tests* provide samples of the child's behavior, usually collected in an optimal setting, that can be compared to his/her age or occupational peers in some specifiable population. Some may wish to classify these tests as "quick and dirty," much as the foregoing methods were categorized. The charge is certainly justified in many ways but all such

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instruments *do* have the advantage that the estimate is the direct result of the behavior of the child and not someone's opinion about the behavior. Another advantage of standardized tests is that they offer suggestions for more specific assessment, in spite of the fact that they seldom say much about functional behavior in settings within the natural environment (e.g. classroom, home, community). Like the other methods presented so far, they are efficient.

6. *Nonstandardized tests* are precisely the same as standardized tests but for two characteristics; (a) they do not have normative data that can be used for comparative purposes; (b) they are often developed by individuals who have little competence in test construction. While the first characteristic is not a serious problem, the second is an insurmountable disadvantage. Depending on length and the specific items within the test, they may attempt to measure global attributes (e.g., mathematics) or very precisely state objectives. If they are well constructed, nonstandardized tests can be far more useful for some purposes than the best standardized test available.

7. *Observation* refers to the collection of assessment data as the behavior to be measured spontaneously occurs, usually in the natural environment. Although global references about behavior can be derived from such data (e.g., classroom climate), the recent trend has been toward the observation of relatively discrete behavior (e.g., out of seat, talk outs). Like any other assessment method, observation can be carelessly done, to the point that the data become little more than anecdotal notes about what the assessor supposes s/he saw occur. Under these circumstances, the more appropriate name of the method used is screening device.

8. *Task analytic assessment* refers to observing the child's behavior on a given task analysis, i.e., what can the child do and not do; this specific type of assessment allows for selection of entry level skill to begin instruction.

Pretesting provides the teacher with an index of a student's current functioning level. Specifically, it enables the teacher to determine which specific skills a student is able to perform and which skills need to be taught.

As you can see, there are a number of teacher activities that are important to attaining valid, reliable pretest results: *(refer to Transparency No. 4)*

1. First, one or more assessment guides must be selected, ordered, and obtained before pretesting can begin.
2. Next, the teacher must decide which skill areas of the guide(s) will be used and which specific items within each of those areas will be tested with a particular student. While PL 94-142 provides the broad skill areas which must be assessed (self-help, psychomotor, etc.), it remains the teacher's decision as to which checklist items in each area will be pretested. Given that in most cases the teacher simply will not have adequate time or support personnel to test every classroom student in each skill area on every checklist item, team diagnosis, consultation with other teachers, developmental theory, and the performance history of the student will probably afford the most accurate clues to what should be pretested with a particular student.
3. How is the teacher, or others, to know when and if a student has passed the pretest for a checklist item? The answer of course depends upon the pass-performance criterion the teacher has established at the time of the pretest. Should the criterion be 100% correct? Should it be 9 out of 10 times correct? Or, 3 consecutive times correct? Or perhaps 4 out of 5 times correct on 5 consecutive school days? While there is no hard and fast rule for criterion determination, there are two guideposts: if the criterion is set "too low," the student will pass the pretest but fail to perform that same skill on some subsequent occasion; if the criterion is set "too high," the student may fail the pretest (due perhaps to fatigue, inattention, boredom, etc.), yet still be able to perform the skill. As usual teacher experience, consultation with others, and student performance records will in time assist in this decision.
4. *All* testing materials should be in place prior to assessment in order to save testing time and needless interruption. For example, if the test item on the checklist calls for the student to brush his/her teeth, then the toothbrush, toothpaste, towel, etc. should be available at the time of pretesting.
5. The test situation should be free of distraction insofar as possible, to promote an accurate assessment of functioning level.
6. Student attention during pretesting is a must for an accurate evaluation of a student's functioning level.
7. All possible prompts should be avoided during pretesting. Otherwise, it might be said that the student responded to various cues such as the teacher's smile, voice fluctuation, or hand gesture.
8. No rewards (or penalties) should be administered during pretest; otherwise, it could be said that the student was prompted to provide the correct answer through the use of reinforcers, etc.
9. Finally, the teacher records the student's response as correct or incorrect, repositions the task materials, repeats the task request ("Johnny, brush your teeth") to the established criterion, and moves on to the next test item.

It should be emphasized that the very same conditions remain in effect during both the pretesting and posttesting steps. This adherence to standard testing practice can help ensure that any gains the student achieves in posttest scores were due to improvement in performance, rather than due to some type of teacher prompt, classroom distraction, or reward.

During pretesting (and posttesting) it is important that the teacher be aware of possible prerequisites for the skills tested with the assessment checklist. For example, in order to perform the toothbrushing task called for by a checklist item, a student must be able to grasp objects. If that student fails the toothbrushing task and if the teacher is alert to the possibility that failure was due to an inability to grasp objects, then "grasping objects" as a motor skill can be noted by the teacher as a prerequisite to toothbrushing and subsequently listed as an Instructional Objective for later teaching.

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Regarding the awareness of and search for prerequisites for skills, probably no student skills are more critical to effective learning than attending behaviors. If a student does not attend to tasks, is not taught to attend, and thus seldom attends, then instruction in general and IEPs in particular can not be expected to meet with any success.

Five attending behaviors are perhaps most crucial to on-task student learning; as noted above, they include:

1. Eye-eye contact -- One difficulty encountered when working with many handicapped students is their tendency to become "hooked" on all sorts of teacher prompts other than the task request itself. Thus, one approach to re-orienting students to the task request or teacher direction is to teach eye-eye contact. If the student is looking at the teacher's eyes (or face, for that matter) the chances are far greater that s/he will comply with the task request.

2. Eye-material contact -- Many handicapped students also tend to perform a task, however unsuccessfully, while looking at the teacher, surveying the room, or engaging in any of a number of behaviors which prevent the student from actually looking at and seeing what precisely s/he is doing. Unless each student is taught to look at the materials being manipulated, later tasks involving object and pattern identification and discrimination, match-to-sample, oddity exercises and the like will be most difficult to teach.

3. Hands down/in lap -- Similarly, it is important to teach students to keep hands below the table surface or in lap (if the student is sitting) or at the side (if standing). Many handicapped students engage in self-stimulatory or stereotyped behaviors such as twirling or twittling fingers in front of eyes, etc. As such behavior inevitably interferes with task performance, needless problems will be avoided if students are taught to keep their hands down during instruction.

4. Appropriate verbal behavior -- Shouting, screaming, nonsense babbling which interfere with task performance should likewise be eliminated, for instruction to be successful.

5. Appropriate sitting/standing -- Often, students jump up and down, gyrate in their seats, and otherwise engage in behaviors which again interfere with compliance to task requests. In the interest of achieving as must student task-related performance as possible in the shortest time period, the less the interfering behaviors, the greater will be the opportunities for practice and learning.

Teachers of severely and profoundly handicapped students are faced with an awesome task -- producing change in individuals whose rate of change is difficult to measure and whose ability to change may be hidden by multiple handicaps.

To assist you in producing changes in your severely and profoundly handicapped students, we must start at the beginning of the systematic instructional process with assessment. We have discussed what assessment is and various methods of assessment. Now we will discuss specific standardized and non-standardized tests which you can use with your students.

In this activity you will be analyzing_____tests that are used with severely and profoundly handicapped individuals. You are to divide into dyads and each dyad will analyze _____tests. You will examine the tests for 20 minutes, then present your information to the large group. I will hand out to each group a Test Analysis Form which lists questions to be answered as you analyze the test. Are there any questions?

Before you break up into your groups, it may be helpful if I define two terms for you: reliability and validity. Reliability of assessment refers to the accuracy with which information is collected. Validity of assessment refers to the type of assessment tool(s) which has been selected to measure a given type of behavior, i.e., a screening device such as the Vineland Social Maturity Scale would not be appropriate for assessing specific play and social interaction skills.

Hand out "Test Analysis Form" which is in the Participant Materials section.
Handout No. 5 should be distributed following this activity.

The purpose of data collection is to provide information upon which decisions can be made that will enhance pupil progress. In beginning to collect data, it may be wise to collect data only on a few behaviors. Collecting data on a few behaviors will allow you to become familiar and comfortable with data collection. It will also provide you time to evaluate the benefits of data collection in terms of your efficiency and effectiveness in promoting child change. You can increase the number of behaviors as soon as you feel comfortable with the process you have set up. Remember data collection should be easy and comfortable to carry out and should provide information which is useful for making programming decisions.

In order to collect data, one must define the behavior on which data are to be collected. In order to count or time a behavior, it must be well defined. A behavior should be observable, repeatable, and countable.

Which of the examples on Transparency No. 11 include all the elements of a well defined behavior; Allow time for participants to answer question. Then refer them to Transparency No. 12.

Before you select the type of data to be collected you must determine the critical dimensions of the behavior with which you are most concerned. The most common dimensions of behavior are: accuracy, proficiency (accuracy and fluency 'speed') duration, and latency. Another critical dimension may be the amount of help required from the teacher for the pupil to carry out the behavior in question (the level of assistance, physical prompt, verbal cues, etc.).

Upon determining the critical dimensions of the behavior you wish to observe and knowing how to compute such data, you will be ready to implement data collection. There are four steps to follow in implementing data collection:

1. Determine *how often* to collect data on the behavior specified.

2. Determine the *length of time* data will be collected.

3. Determine *who* will collect the data.

4. Determine the *counting, timing, and recording procedures* and/or tools to be used.

Step 1. Determine how often to collect data on the behavior specified.

Optimal data collection should occur daily. The more data collected and used, the less time the pupil is subject to failure. This means that an effective instructional strategy can be discovered and changed sooner. The picture of how a child learns is more accurately displayed when continuous data is taken. Minimal data collection should occur no less than two times a week. Data collected once or twice a week may give a distorted view of a child's progress because it may only reflect the child's good or bad days. If you are new at it, try three times a week. Whatever the reason, frequency of data collection should be determined by the type of information needed.

Step 2. Determine the length of time data will be collected.

The length of time depends on: (1) the frequency and pattern of the behavior, and (2) the ease with which these behaviors can be observed.

Usually the higher frequency of a behavior the shorter the length of time required for data collection. For academic, preacademic, vocational, and self-help programs, you may often choose a very short period of time during which to measure the behavior or skill being taught. One minute samples are valid and widely used. As a rule of thumb, select a time period during which you can observe at least ten of the behaviors you are counting.

The lower the frequency of a behavior, the larger the length of time required to take data. Data collection procedures for low frequency behaviors should be determined by the frequency and pattern of occurrences and by the ease of observation. For infrequent behaviors (tantrums, making vocal sounds), the teacher can count them throughout the day.

The length of time collecting data on one child is directly tied to the amount of time the teacher spends directly with that child.

Step 3. Determine who will collect the data.
There are three choices of data collectors usually available in a classroom.

1. The teacher and/or aide(s), parents, support personnel, volunteers.
2. The pupil on whom data are being collected.
3. Another pupil.

Step 4. Determine the counting, timing, and recording procedures and/or tools to be used.

1. Counting devices and procedures: The counting procedures you use depend on the type of behavior being measured. For infrequent behaviors the data can be tallied on a slip of paper or masking tape attached to clothing or to the desk. Wrist counters can also be used. For frequent behaviors the number of responses can be counted after the task is completed or a predetermined number of responses can be presented. Wrist counters, double storage unit bank counters and gate counters can be used.
2. Timing devices and procedures: Wall clocks, wrist watches, digital clocks with second hands are the teachers best bet for timing in the classroom. For long periods of time a kitchen timer is helpful.
3. Recording: There are two major considerations in recording the data that have been collected.
   a. Recording should be consistently carried out.
   b. There should be a specified place to record data.

A pattern for recording data should be established and followed. It can be immediately after they are collected or at the end of the school day. The choice of data recording procedures should be made according to what is easy to implement and maintain in the classroom.

After you have your data recorded, there are three ways of looking at it.

1. Is the behavior *accelerating?*
2. Is the behavior *decelerating?*
3. Is the behavior *maintaining* itself?

Review your charts, graphs, data at least twice a week. If you do not see a change in an acceleration or deceleration target within three days, change the intervention plan. Do not collect data just to collect data. Data are collected in order to make changes in your teaching behavior (change the reinforcers, redefine your goal or objective - higher - lower).

"We have talked about the importance of measurement and ways of collecting data. Now we need to look at ways of presenting our data to other people so that they too can be aware of the effectiveness of particular training programs. For instance, how effective do you feel it would be to present to the parents of one of your students, your raw data sheets in response to their question concerning their child's progress?"

Anticipated Response: Any comment made by a workshop participant indicating that raw data sheets would not probably be effective communication.

"That's right, it is unlikely that you would find many parents that could look at a page of raw data and determine whether or not their child was progressing as planned. Therefore, it is our job to identify a way that can communicate the actual progress of their child in an effective manner. Does anyone have a suggestion on how we can compile this information and present it in a more effective manner?"

Anticipated Response: Any participant comment indicating the use of graphs or graphing techniques.

"Correct, a graph can pictorially represent data or any numerical information that you have collected over a period of time. I think you will find that not only are the graphs useful for communicating with others, but they are also helpful to you for seeing small measures of progress over long periods of time. As with everything we have done in this training session, it is important to make sure that you and I also are clear and are consistent in our construction of graphs."

Put Transparency No. 15 on the projector and pass out one copy of Worksheet No. 2 to the participants.

"Let's look at a sample graph which is already labeled. The horizontal line, or in this case the bottom line, of a graph is called the abscissa."

Point to this line on the overhead.

"According to this sample graph, what kind of information is recorded on the bottom line or the abscissa?"

Anticipated Response: The number of sessions or number of days or number of weeks or each occurrence of the same behavior.

"Okay, so in addition to actually numbering our hash marks on the abscissa itself, it is very important to label the line in order for other people to use the graph of your data effectively. So, the abscissa should always be numbered and labeled to indicate what the numbers represent. The line running vertically on our sample graph is called the ordinate. What kind of numbers are placed along this line?"

Anticipated Response: Percent or number. If percent is the method you are selecting to use, this line would always be labeled 0-100 with the hash marks being any division of 100 most useful for your purposes. For instance, we could number from 0-100 by tens, by twenty-fives, by twenties. So, the way this line is numbered in percent does not matter, except that it is numbered from 0 to what?

Anticipated Response: 100.

"In addition to the hash marks being numbered, they should also be spaced equally. In addition to labeling the ordinate percents, what other information could we apply to the ordinate?"

Anticipated Response: The number or how many times a behavior occurred.

"Let's say that a child had 8 tantrums a day and we wanted to decrease them to 0; what numbers would we use for the hash marks?"

Anticipated Response: 0-8.

"In our example we have identified the highest number of behaviors we expect to occur, which gives us the highest number needed on the ordinate. In other cases the highest number of behaviors you anticipate to occur will determine how you will label the ordinate. For instance, if you want a child to perform a particular behavior 9 out of 10 times then your ordinate will be labeled 0-10. It is important to remember that the hash marks on the bottom line and on the side should be the same distance apart. It doesn't matter what the distance is, as long as the distance is the same. On your worksheet, notice that the spaces on the bottom are smaller than the spaces on the side. But all of the

spaces on the bottom line are the same distance apart and all of the spaces on the side or ordinate are the same distance apart. If all the spaces are equal, your linear representation of that numerical fact will also be equal. One more fact about the ordinate side of the graph. Notice that 0 has a line of its own. It is not the bottom line but just above the line. There is a reason for this. If a particular behavior is going to decrease to 0, then we want to be able to see 0. If a particular behavior is not occurring now, then we will want to see that at this point in time it is at a 0 rate. When 0 is above the bottom line it is easier to see. Can anyone tell me what the term 'baseline' means?"

Anticipated Response: A period of time during which data is collected to determine the present level of behavior. Accept any response which indicates determining present level of behavior prior to treatment.

"How long should your baseline period be?"

Anticipated Response: 3 to 5 days, or until the level of behavior appears to be stable.

"Why do we need a baseline measure?"

Anticipated Response: To objectively determine whether or not a treatment program is needed for this particular behavior, or as a comparison to determine whether or not your treatment program is affecting the behavior in the desired manner.

"Because we now have a stable record of the present level of behavior we are ready to implement our treatment program. In order to separate our baseline period from our period of intervention, we include a solid line on the graph running vertically entitled the dividing line. This line on your graph lets those who see it know that at this point you intervened and changed the situation in some manner from the baseline period. Let's review our graphing techniques. Why do we need a baseline?"

Anticipated Response: To observe the level of behavior before intervention.

"What does the dividing line signify?"

Anticipated Response: A change in procedure or program.

"What is the most important fact to remember about the spacing of your hash marks?"

Anticipated Response: They have to be the same distance apart on any one given line.

Pass out to each participant one piece of graph paper, a ruler if available, and one copy of Worksheet 3. The preparation of this graph will be conducted as a group. Therefore, the instructor will need to have one clear transparency to draw the graph as the participants instruct. Put the blank transparency on the projector.

"I have just passed out some data collected on a program to reduce a particular behavior. The first five days were baseline and intervention was started on the sixth day. I will draw the graph on the overhead as I am instructed by you. What is the first thing I should draw?"

Anticipated Response: The abscissa and the ordinate.

"How shall I number the abscissa?"

Anticipated Response: 1 - 20.

"How should these numbers be labeled?"

Anticipated Response: Days.

"How shall I number the ordinate?"

Anticipated Response: 0 - 5.

"How should I label the ordinate?"

Anticipated Response: Number of Occurrences.

"How many times did the behavior occur on the first day of observation?"

Anticipated Response: Three.

"How many times did the behavior occur on the second day?"

Anticipated Response: Four.

"How many times did the behavior occur on the third day?"

Anticipated Response: Three.

"How many times did the behavior occur on the fourth day?"

Anticipated Response: Four.

Proceed through all 20 days in the preceding manner. At this point your graph will have an appropriate point representing the number of times the behavior occurred for each of the 20 days data was collected.

"Where do we put the dividing line?"

Anticipated Response: Betweun day 5 and day 6.

"Please turn your worksheet over and looking at the graph we just constructed, let's practice reading it. Over how many days was data kept?"

Anticipated Response: 20 days.

"How many days was baseline kept?"

Anticipated Response: Five.

"What was the largest number of times the vehabior occured in one day?"

Anticipated Response: Five.

"On how many days did the behavior occur only once?"

Anticipated Response: Eight.

"On the twelfth day, how many times did the behavior occur?"

Anticipated Response: Two.

"On the third day, how many times did the behavior occur?"

Anticipated Response: Three.

"Do you think the procedure being used was reducing the behavior?"

Anticipated Response: Yes.

"Why?"

Anticipated Response: Because the occurrence of the behavior went down to 0.

Please remember to reinforce and acknowledge all participant involvement and correct responses. Pass out to each participant one copy of Worksheet 4 and another piece of graph paper.

"Worksheet 4 contains the data for a program requesting a student to visually localize an object on verbal cue. The first five lines of data represent the baseline period. Because the total number of requests keep changing, we are going to have to look at the percentage of time, not the number of times the student followed the requests."

"Using Worksheet 4, prepare a graph reflecting the progress of this program designed to increase a student's visual localization."

Allow your participants approximately 10 minutes to complete their graph. As they are working on their graph, circulate among the group answering questions and providing directions as necessary. When it is obvious that the majority of the participants have completed their graph, place Transparency No. 16 on the projector.

"The first five sessions were the baseline. On the first day of the intervention, what percentage of requests were followed?"

Anticipated Response: 20%.

"For how many days was the program or procedure in use?"

Anticipated Response: 12 days.

"What percent of requests were followed on the ninth day?"

Anticipated Response: 67.

"What percent of requests were followed on the sixteenth day?"

Anticipated Response: 100%.

"On the sixteenth day, what percent of requests were not followed?"

Anticipated Response: Zero.

"How did you get zero?"

Anticipated Response: Subtracted 100 from 100 equaling zero.

At this point, if you feel your participants need more practice using the percentile chart, provide them with a couple of examples that the group can use for determining percentages. After you feel your participants can effectively use the percentile chart, pass out one copy of Worksheet 5 and a piece of graph paper to each participant.

"On Worksheet 5, list the data collected for an eating program used with a particular child. It was determined by this child's trainer that the child presently had the skills to eat in a reasonable length of time but was not completing the meal in what was determined by the trainer to be a reasonable amount of time. The first five days represent the baseline period. Since dessert seemed to be a very desirable part of the meal for this child, the trainer decided that the child could earn dessert by completing the meal within 20 minutes. Using the data presented, each of you prepare a graph and

let's look at whether or not we feel this program was effective in getting this child to eat the meal within 20 minutes.

Allow your participants approximately 10 minutes to complete their graph. As they are working on their graph, circulate among the group answering questions and providing directions as necessary. When it is obvious that the majority of the participants have completed their graphs place Transparency No. 17 on the projector.

"What should the label on the left-hand side of your graph be?" Point to the vertical side of the graph.

Anticipated Response: Length or amount of time spent eating in minutes.

"On the twelfth day, did the child get dessert?"

Anticipated Response: No.

"Why?"

Anticipated Response: Because it took the child longer than 20 minutes to eat the meal.

"On what days did it take the child 15 minutes to eat the meal?"

Anticipated Response: Tenth, eleventh, thirteenth, and fourteenth.

"Did the child ever eat the meal in less than 15 minutes?"

Anticipated Response: Yes.

"On which day?"

Anticipated Response: The ninth day.

"Looking at the graph, would you say that the program implemented by the trainer was effective?"

Anticipated Response: Yes.

"Why?"

Anticipated Response: For five of the ten days data was collected after the program was implemented, the child finished the meal in under 20 minutes which was the criteria determined by the trainer for this program.

"Today you have prepared three different graphs. This brief exposure should help you see the value of presenting the data you collect from your training programs in such a manner. There are other types of graphs you may wish to use in presenting your data, but the three we have used today should serve you well in representing information you will be obtaining from training programs for your students. Do you have any questions?"

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The selection of objectives is an important program decision which must be made in the initial stages of program development. Careful choice of what to teach will play a major factor in whether the child will learn the skill, and also how quickly the skill will be acquired. Program objectives which are irrelevant, too difficult, or too easy will result in needless failure and may lead to inappropriate classroom behavior.

It is also important that instructional objectives be logically sequenced. Handicapped students learn more quickly when material is presented in a logical progression of easy to hard. Lack of sequencing, or faulty sequencing is, unfortunately, a frequent limitation of many instructional programs for handicapped students. The inability to present objectives in a carefully developed skill sequence reduces the speed with which the objective will be attained as well as diminishing the effectiveness of instructional procedures.

The purpose of this lecture is to discuss how to develop annual goals and set short-term instructional objectives which are relevant to a child's educational program.

The importance of writing objectives cannot be overstated. Well written objectives will provide the teacher, the parents, and other educational personnel with concrete statements of what skills a child should achieve in a specified period of time and will serve to focus educational attention on critical areas of instruction.

Reasons for Writing Objectives

There are five basic reasons for writing objectives:

1. To provide a guide for curriculum development or to sequence instruction.
2. To provide a basis for evaluation of pupil progress.
3. To provide the teacher with criteria to determine when an educational target has been achieved and when to focus on new targets.
4. To provide parents, teachers, administrators and the pupil with information as to what is expected in an educational setting and when it is accomplished.
5. To meet administrative and/or legislative requirements.

Relationship of Annual Goals and Instructional Objectives to the Individualized Education Program

At the completion of assessing the child's present levels of performance the teacher will have a profile of strengths and weaknesses. This profile includes assessment data stating entry proficiency levels for each broad skill and the enabling skills which undergird each broad skill for each relevant domain. This information must now be translated into annual goals and instructional objectives. Public Law 94-142 requires that the individualized education program for each child must include:

(a) A statement of annual goals, including short term instructional objectives; and

(b) Appropriate objective criteria and evaluation procedures and schedules for determining, on at least an annual basis, whether the short term instructional objectives are being achieved.

Annual Goals

Goals are statements about broad skills within relevant domains. They describe what broad skills a pupil should attain and at what rates, i.e., in what particular time periods.

The Criteria of Ultimate Functioning

Annual goals must be determined carefully by assessing each child and then ordering individual needs into different priorities. Because most handicapped children exhibit numerous skill deficits, the teacher must attempt to make judicious decisions concerning which skills should receive the greatest priority.

Arrival at a decision of the most appropriate goals for instruction should be influenced by the

"criterion of ultimate functioning":

The criterion of ultimate functioning refers to the ever changing, expanding, localized, and personalized cluster of factors that each person must possess in order to function as productively and independently as possible in socially, vocationally, and domestically integrated adult community environments.

(Brown, Nietupski, & Hamre-Nietupski, 1976, p. 8)

It will be necessary to make some attempts at predicting what curriculum content will influence the child's adult functioning. Although this is not an easy decision, it is essential that longitudinal planning be exercised for each individual child. As parents become more involved in the planning process, they will inquire more frequently as to the relevance of skills which are being taught. Educators must be prepared to defend and justify skill priorities in the educational curriculum for each child.

Identifying Annual Goals

What are relevant goals for handicapped students? More specifically, what issues should be taken into consideration when selecting skill areas for instruction? At a minimum, special educators must answer the following questions in selecting appropriate curricula for students:

1) Why should the skill(s) be taught?
2) Is the skill(s) necessary to prepare students to ultimately function in complex heterogenous community settings?
3) Could students function as adults if they did not acquire the skill?
4) Are there other important skills which might be trained more quickly and efficiently?

If selection of appropriate goals cannot be justified, then educators may be teaching handicapped students skills which are not critical to a long range plan for the child. As an illustration, consider the prospect of teaching a secondary level class of trainable level retarded students phonics skills. The avowed purpose of these daily lessons is to develop reading abilities in students. In all likelihood, these reading goals would not be wise since 16, 17, 18 and 19-year old moderately and severely handicapped students have a very limited amount of time in public school (until 21), and phonics training can be a lengthy means of attaining reading skills. An alternative set of reading skills which could be more desirable would involve basic sight word recognition and comprehension skills. These skills might facilitate prevocational training and community living preparation.

A second example will hopefully describe the critical aspects of goal selection in further detail. With the current proliferation of early intervention programs for developmentally delayed children, preschool programs are increasingly serving toddlers with a wide range of disabilities. Assume that a given preschool program has a preponderance of multiply handicapped infants with severe physical involvements, and that a major portion of the curricula for the class calls for learning shape, size, and color discriminations, as well as other preacademic "readiness" activities. Unfortunately, a very limited amount of time is left for potty training, physical therapy, language training through use of communication boards, etc. Clearly, this would be an illustration of selection of goals which are not as relevant or appropriate as they could be.

Although these examples may appear remote and somewhat exaggerated, they unfortunately, are not. In many special education classes, students are not taught skills which are important for them Goals which are selected for instruction are usually those which:

a) the teacher is familiar with, that is, has either taught before or has been trained in;
b) the teacher believes erroneously are the most critical for the student's successful work of community placement upon completion of school.

Setting Goals

Setting goals requires that broad skills be specified for students. Rates at which the child is expected to learn to accomplish those skills must also be projected. This is the point where broad skills of instruction, as well as rates of instruction, are adjusted to the child's present levels of performance. Consequently, this is a critical juncture in individualizing instruction.

In order to formulate relevant annual goals the following information is required:

1) Specification of the individual's present levels of performance. This must include data

stating the individual's proficiency level for each broad skill and the undergirding enabling skills for each relevant domain. These data are available from the follow-up assessment profile.

2) Specification of the individual's rate of learning for each relevant broad skill. This information should also be available from the follow-up assessment data.
3) A chart which describes a logical sequence of broad skills in each relevant domain.

Instructional Objectives

Instructional objectives are statements about the enabling skills a student must master in order to meet annual goals. They describe the specific skills which undergird the broad skills. The relationship is as follows:

1) A domain is made up of broad skills in a given area such as reading, arithmetic, motor, or self-help.
2) Each broad skill within a domain is made up of (specific) enabling skills
3) Annual goals are stated in terms of broad skills which need to be taught.
4) Instructional objectives are stated in terms of enabling skills which the pupil must master in order to learn the broad skill.
5) The decisions about which domains, broad skills, and enabling skills need to be taught are based on the assessment data and the appropriate skill sequence chart.

Instructional objectives are the cornerstone of the individualized education program. Instructional objectives are the target and products and have two basic purposes:

1. They serve as the basis for selecting instructional procedures. That is, the instructional procedures should be designed to lead to the behavior specified in the instructional objective.
2. They serve as the basis for selecting evaluation procedures. Evaluation procedures should be designed to enable the pupil to demonstrate whether the behavior specified in the instructional objective has been attained.

Criteria for Instructional Objectives

As teachers develop and select instructional objectives they should be guided by five criteria. These criteria pertain to sources, comprehensiveness, specificity, explicitness and completeness (Blake, 1974). Blake states these criteria as follows:

1) The instructional objectives should be relevant to the society, appropriate for the learner, and suitably placed within the structure of the content discipline.
2) The instructional objectives should be stated. All material in instructional programs should be keyed to particular objectives. If not, the material should not be there. The instructional program should have material for each objective.
3) The instructional objectives should be neither too precise nor too broad. They should be at the generality level which the teacher and pupils can deal with.
4) The instructional objectives should be unambiguous. Everyone who reads them should be able to agree about what instructional and evaluation methods are appropriate, and when the objective has been attained.
5) The instructional objective should be complete. It should contain the three components -- the content elements, the behavior elements, and the required level of mastery. (Blake, 1974, p. 174-177)

Procedures for Specifying Instructional Objectives

A behaviorally stated instructional objective involves anchoring the objective in the enabling skill and the pupil's behavior. According to Mager (1962), this involves three components: a statement of given conditions under which the desired performance should occur, a description of the desired performance, and a listing of the criterion for adequate performance.

Specifying performance conditions. The performance conditions specify the testing conditions i.e., what the learner will be given or allowed to use during the testing situation. Such statements are usually introduced by the word "Given..." or "Using..." or "Referring to..." and the entire phrase generally precedes the terminal behavior. For example,

Given words in which the spelling conforms to the "finale" principle, the pupil can supply the correct spelling with 95 percent accuracy.

Specifying desired performance. When decisions are made about the desired performance, the enabling skills are selected in order to achieve the broad skill specified in the annual goals. As stated earlier, it will be necessary to consult a skill sequence chart for the relevant domain and the follow-up assessment profile. Judgments should be based on what enabling skills the student has mastered and what enabling skills remain to be mastered before the broad skill is learned.

It is difficult to be explicit about the enabling skills the pupil must learn. The key element is the verbs which are used. These verbs must be concrete; usually action verbs most effectively describe. That is, they must refer to unequivocal behavior that is clearly observable.

Specifying criterion of adequate performance. When the performance criterion is established, it is necessary to specify the *how well* part of the instructional objective. This is the achievement level that a teacher considers sufficient for the student to begin work on the next highest enabling skill. To specify the achievement level, it is necessary to decide about reference standards and cutting points.

Blake (1974) describes two types of reference standards: absolute mastery and relative mastery. Absolute mastery means criterion referenced. Each pupil's performance is judged against how much content is learned. The achievements of other pupils are immaterial. Relative mastery is norm referenced. Each pupil's performance is judged against how much is learned in relation to how much other pupils learn.

After a reference standard is selected, the next decision is about cutting points. The question is: how much should the student be expected to attain in relation to the content or group? The following rationale undergirds setting cut-off points (Blake, 1974): Enabling skills are taught in order to ultimately achieve broad skills. Therefore, it is necessary to teach for a maximum of retention and positive transfer.

Now you have the opportunity to practice writing some long term and short term objectives related to a specific educational goal for an individual. You may wish to choose a student with whom you are working presently, so the activity will be relevant to your needs.

You will divide into trios. Each of you will receive a Behavioral Objectives Activity Sheet (Worksheet No. 6) . When you are in your groups, you should each select a skill area (such as self-help, vocational, language, etc.) and write a goal for the student in that selected skill area.

Then, as a group, write one long range objective and two short range objectives which, when met, will help the child reach the goal.

Your completed activity sheet will look like this. *The activity sheet is in the Instructor's Materials section--refer to Transparency No. 22* Are there questions? *Reiterate directions after the participants are divided into trios.*

You will have 20 minutes to complete this activity.

We have one final activity for you to practice writing objectives. Divide into six groups. Each group will be numbered (1-6) then given a worksheet (Handout No. 7). On the sheet are statements which you should convert to behavioral objectives. Use a work sheet for each participant. You have ten minutes to write a behavioral objective for each of the two statements your group has. Then you will share your objectives with the large group.

Once annual goals have been identified and instructional objectives written, then enabling skills must be broken down into small components and logically sequenced. The order in which instructional objectives are presented greatly influences how handicapped children learn. The amount of material which is presented will also influence learning (Blake, 1976). It is important that teachers develop instructional sequences which facilitate the use of these basic principles of learning.

Task analysis is the breaking down of skills into smaller components which may be easier for the child to learn. It is a process which involves a logical sequencing of material from easier to more complex. A task analysis of an enabling skill provides a precise description of the child behaviors which are expected in a given instructional situation.

Skill sequencing may be considered as a logical progression of instructional objectives within a given domain. Williams & Gotts (1977) define skill sequences as: *"A skill sequence is delineated to provide a framework of tasks or objectives within which many types of instructional programs may be organized. A sequence is not a statement of how to teach but rather a statement of what is to be taught and in what order" (p. 221).*

What must be recognized is that careful sequencing of enabling skills is a critical aspect of the instructional situation between the teacher and child. Expensive materials, favorable staff ratios and the most innovative of teaching activities are not being efficiently used when material is not presented in a logical sequence, or worse, when no sequence is provided at all.

The arbitrary selection of isolated skills for handicapped students is an inadequate means of providing optimal educational services. In order for the child's educational program to flow logically and consistently over the approximately 18 years in school, skills must be selected from relevant domains that are clearly tied to the child's longitudinal or long range educational plan.

Why a Teacher Should Have Task Analysis Competencies

A task analysis approach to presenting information is optimal becuase it provides an instructional sequence and allows for the presentation of material in small chunks. By analyzing objectives into small increments which are logically sequenced, the child will more quickly grasp the material. Special educators must be able to effectively employ task analyses and skill sequences in classroom programming and should thoroughly understand the multiple advantages of this approach.

Individualizing Instruction

Another major advantage of a task analysis approach is that instruction for students with different functioning levels may be individualized. Although some students may perform the majority of steps or phases in a skill sequence, others will be unable to complete even one-third or one-fourth of the task. With task analysis, a child's instructional program can be tailored to the appropriate functioning level. Furthermore, children can move through the sequence at their own speed.

Homogeneous grouping within the class, and according to skill level, will also be facilitated for each curriculum area. Because it is not usually realistic or practical to provide 1:1 instruction for each child in the class, it may be advantageous to place students in small groups with regard to their performance in a skill sequence.

Facilitates Teaching

In conducting precision assessments of the child's given skill level in a given domain, it is helpful to pinpoint the entry level target behavior at which the child is presently functioning. With a task analysis it will be possible to decide exactly where the student requires instruction (Knapczyk, 1975). Reliable observational assessment will indicate the student's strengths and weaknesses in a given enabling skill, thereby providing objective evidence that the child needs a program prescribed to remediate those weaknesses.

Finding behavioral pinpoints within well developed instructional sequences facilitates learning by handicapped students and promotes more efficient instruction. Children who receive instruction at a level in which they are already proficient will become bored; on the other hand, students who are taught component skills at too high a level are more likely to fail.

Objective Means of Evaluation

In order to evaluate progress which handicapped children make in instructional programs, it is advantageous to objectively record the performance gains which are observed by the teacher. Evaluating progress demonstrated on an instructional skill sequence is a logical extension of the assessment process described above. Use of task analysis sequences is one means of evaluation which will minimize teacher bias of the child's progress.

Another aspect of this form of evaluation is that it can provide reinforcing feedback to parents and teachers who are working with severely handicapped children. Students who exhibit gross language and motor handicaps usually progress very slowly. A task analysis sequence which is subdivided into minute behavioral increments will more precisely reflect the child's progress. Although the steps achieved may be very small, it will still be positive to see the gains which can be made.

Replicability

Another positive feature of a task analysis approach is that it facilitates replicability of the instructional program by other classroom staff. If a skill sequence is implemented with a child, there will be a logical order in which the child's behavior should develop; there should also be a sequence to the behaviors which are required by the teacher in order to make the responses in the skill sequence occur.

In order for teaching associates, practicum students, student teachers or other paraprofessional staff to effectively help the teacher carry through a program there must be consistency. When the order of instructional behaviors is clearly specified, then with minimal instruction, other staff may be able to also implement the program. For substitute teachers who must fill in for extended periods of time, skill sequences will be helpful.

It will also be beneficial if other teachers can obtain similar results with instructional program sequences. If a certain task analysis facilitates learning for one class of handicapped students, it may be successful with another class. This might reduce the amount of time which educators must spend in selecting appropriately sequenced and analyzed task analyses. Increasing success with selected task analyses will also suggest the empirical validity of such a sequence.

Methods of Generating Skill Sequences

To this point, discussion has centered around why teachers should select relevant goals and objectives, and why task analysis is an important instructional competency. The purpose of this section is to identify and describe how to develop task analyses and skill sequences. Several specific methods of generating skill sequences and locating resources which facilitate the development of instructional sequences are delineated.

Reviewing Existing Resources

Once relevant domains for instruction have been selected for the child, it is necessary to do a careful review of the available commercial program literature. In recent years, more and more publishers have been providing texts which offer already completed and field tested skill sequences. Through use of these books the teacher can save valuable curriculum development time by modifying, adapting or replicating relevant instructional sequences.

A good example of one such resource is the text developed by Anderson, Hodson and Jones (1974) which is entitled Instructional Programming for the Handicapped Students. Within this compendium are well over 100 task analysis sequences representing a number of curriculum areas among them, writing, arithmetic, motor development, self-help and prevocational training. Similar texts have been published by Bender and Valletutti (1976), Myers, Sinco, and Stalma (1973) and Wehman (1978).

The value of texts such as these is that replicable instructional sequences are provided which may facilitate task analytic assessment, learning in small parts, and objective evaluation. Furthermore, they usually span a large number of curricular areas across a wide range of disability categories. Clearly, the use of such commercial resources can be a savings on teacher time.

On the other hand, a cautionary note should be made. The wise teacher will not take every

printed word as "the gospel"; it may be that some of the skill sequences which are published are inadequate or unacceptable. Simply because the work is published does not indicate that this is the only way, or even the right way. In selecting skill sequences from commercial resources it is usually a good practice to confer with several other teachers involved in programming with a similar population of students.

Modifying Developmental Sequences

Skill sequences may also be generated through careful perusal of textbooks which provide sequences of normal child development. These may be found in child development texts, adaptive physical education books, or occupational and physical therapy textbooks. Much of the cognitive-developmental theory generated by Jean Piaget (1962) may be helpful to the teacher in verifying whether curriculum content and sequence is relevant for students. Another excellent source in the sequencing of cognitive development of infants is the work of Uzgiris & Hunt (1975).

Since most handicapped children are developmentally young in one or more curriculum areas, the application of child development norms to sequencing instructional content may be quite fruitful. Although developmental milestones are usually too broad for teachers to use as enabling skills, they provide a general developmental structure. This is particularly true in cases where little work has been published or is commercially available.

A good illustration of this would be fine-motor sequencing for physically handicapped children, developmentally delayed toddlers, or the severely retarded. Presently, there are few valid skill sequences which exist for fine-motor curriculum. Since the skills involved in this domain (reaching, grasping, transfer, bilateral reach, etc.) are critical to development, a sequence in this area is necessary. A logical means of accomplishing this goal is to carefully scan and review occupational therapy, physical therapy, and motor learning textbooks. From these books, a number of different sequences in fine-motor development will be available. These can be modified into one tentative sequence which must then be field tested with the class. This will allow the tacher to conclude whether the sequence is viable for future use.

Adapting Curriculum Guides

Another means of identifying skill sequences which may be potentially useful is through careful inspection of curriculum guides which have relevant information. These may include workbooks, detailed guides for a similar population of handicapped students, or "homemade" activity books developed by other teachers through experience.

In many ways, educational materials and resources which are already available, although not exactly suitable for a given class, are an ideal source for teachers to review for skill sequences. They fulfill the criteria of being field tested by other teachers. Frequently, such materials can be located quickly and inexpensively through the public school system or possibly a nearby university.

What is critical is that teachers know how to modify educational materials and curriculum guides for the purpose of implementing a logical skill sequence. A good example of the possible pitfalls which may occur from not doing this is reflected in the extensive reliance of many teachers on commercial workbooks. Large numbers of special education classes for educable level retarded children or learning disabled children will rely on the content, and sequence of that content, or reading, arithmetic and other academic primers. This is regrettable since these workbooks often:

1) are inadequate in terms of relevant content;
2) may be "culturally-biased," and therefore, unfair to inner-city black children and other minority groups;
3) fail to provide necessary breakdown in material which is being presented;
4) fail to provide a logical sequence of material.

If curriculum guides and workbooks are used as modifiable resources which provide only the initial curriculum content outline for instruction, then they become an invaluable means of developing individualized skill sequences which are relevant to each child's own educational needs. Before curriculum guides can be employed effectively, however, an education plan must be established for the child, in terms of what skills will be taught. Secondly, the teacher should have the basic skill of *how* to generate a task analysis or skill sequence without the use of any other materials. This competency will

facilitate developing instructional sequences through each of the previous three methods that have been discussed above. It is this competency, how to break down skills and logically sequence objectives, that will now be discussed.

Breaking Down Skills Into Small Steps

In developing skill sequences, there are seven steps which must be carried through. These are listed below and will be explained in detail.

1) Write the instructional objective for the enabling skill;
2) Review instructional relevant resources for the task analysis breakdowns of the enabling skill;
3) Derive the component skills of the objectives;
4) Sequence the component skills;
5) Eliminate unnecessary component skills;
6) Eliminate redundant component skills;
7) Determine prerequisite skills;

(Williams, 1975, p. 34).

Since writing an instructional objective was discussed in depth earlier, it will not be necessary to discuss this process. It should be apparent, however, that the instructional objective is the destination which the teacher is trying to help the child reach. Following the skill sequence will hopefully move the child closer to that objective.

As has been noted above, it is most efficient to review any possible resources which might be considered as relevant to the task of generating a sequence. However, if this search proves fruitless as it well may, particularly with the more severely involved student, then the component skills or the basic steps of the task analysis may be derived through several processes (Williams 1975). Initially, it may be of value to list all the components of a given skill which have been identified, although not sequenced, in other resources, such as curriculum guides and developmental scales. These components can then be arranged in an order which the teacher feels is a logical progression from easy to hard.

Another means of generating component skills for a task is to observe students and simply ask the question: "To master this objective, what skills must be performed?" This question is asked until further component skills cannot be performed.

A third process may also be effective. By slowly performing the target objective yourself or watching others complete the objective, one is able to record the skills which are necessary. Whether imagining the requisite skills, or actually performing them, the teacher is sequentially taken through the skills which lead into the target objective. It is this precise type of task analysis which is necessary before goals of pinpoint assessment and evaluation, and learning in small steps can be accomplished.

Once the components of the target objective are identified through task analysis, then they must be arranged into the logical order required for completion. As an illustration, consider the self-care task of combing one's hair. There may be a total of as many as 23 components of this skill derived from the processes described in Step 1; these components are generated in a somewhat random order in the first part of Transparency 26. In order to be a viable task analysis sequence, those components need to be arranged into a logical and orderly progression. This is done to the side of the behaviors by the numbers.

At this point it may be advantageous to review the sequence and determine whether there are any component skills within the sequence which are either not necessary or repetitious. Furthermore, it is best to "trial-run" the sequence initially before fully implementing it with a whole class of children. It may be that what seemed logical in the analysis stages is very clumsy for actual instructional purposes. The hair combing task analysis provides one example of this. This task could be subdivided into the child combing hair in sections of eighths instead of fourths; however, it would probably make instructional activities and teaching procedures very awkward to implement effectively.

In the final stage of development, prerequisite skills which are necessary to realistically perform the necessary component skills of the task must be identified. These skills can also be considered entry level skills or responses. Prerequisite skills are important because they indicate to the teacher at what level different students must be performing before they can be reasonably expected to acquire the target objective. For example, in order to teach a deaf child to use sign language a logical prerequisite

skill would be motor imitation. A prerequisite skill to independent toileting might be proficiency in pulling down and pulling up pants before and after going to toilet. Entry level skills for counting or addition skills would involve, at a minimum, knowing the concept of set and number. There is frequently more than one entry level skill which precedes the target objective.

Before we leave this section, let us look at Transparencies No. 27-35 and review the sequences and determine whether there are skills which are unnecessary or repetitious.

Developing Curriculum from Skill Sequences

In many domains there has been little curriculum development or inadequate and limited curriculum. When this is a problem, it may be advantageous to consider building up a curriculum from skill sequences which have been previously acquired or developed. In this way, there will be a steady accrual of sequenced content within a given cluster of skills.

An example of one domain which requires greater attention by teachers is community skill training. There is little doubt that if handicapped students of all categories are to be mainstreamed into the flow of society that community adjustment skills must be a priority. Unfortunately, there have been a limited number of community skill sequences which have been developed and validated with handicapped students. What is required is a gradual accumulation of the skill sequences which have been generated to be brought together into a cluster. These sequences can then be placed together logically in a horizontally as well as vertical fashion. An illustration of this might be the functional use of money. Making change would be a necessary skill required for: a) supermarket shopping, b) going to the post office, c) riding a public bus and, d) going to the movie theater. Of course, the list of skills is endless and would depend on the type of community setting (i.e., rural urban) in which the student lived.

Task Analysis

As a final review of task analysis and skill sequencing we have prepared an activity in which you will be required to analyze selected behaviors. First pair off. I will assign a behavior or skill to each group to be task analyzed. Together write a complete task analysis of the skill or behavior given you.

Next, you will each be given some index cards. Write each identified subtask of your task analysis on a separate card. Number the cards on the back so the cards can be put into the correct sequence. Also, make a "title" card which states what the skill or behavior is that you have analyzed.

Then, shuffle the cards for the particular task analysis, so they are out of sequence. Then exchange sets of cards with other groups. Try to put the cards in the correct sequence. Then check the back of the cards to see if you placed the cards in the correct sequence. Review the sequences and determine whether there are skills which are unnecessary or repetitious.

I. DISCUSSION OF BEHAVIORAL TERMINOLOGY

TIME

One hour

Instructions to the Facilitator

Refer to Handout No. 1 before beginning the lecture. Give the participants a chance throughout the lecture to ask questions or give additional examples for each term.

Script

The first thing that we will discuss is terminology——terms that you will be hearing throughout the presentations.

Antecedent Events

When we talk about antecedent events we're referring to *anything* that comes before the behavior, *anything* that comes before the child response, whether it is something you planned to come before the child response or an accident. For example, if you said "Do this," and you touched your head, that is an antecedent event for the response of the child touching his/her head. If another teacher came into the room, slammed the door and the child turned around, that slamming of the door is an antecedent event for the child turning his/her head. You did not plan that. So, an antecedent event is *anything* that comes before the behavior.

Consequent Events

A consequent event is *anything* that follows the behavior. Consequent events can be rewards or reinforcers, they can also be punishers, or things that do not affect the behavior at all So a consequent event can be "Good boy, you did that right," or "No, stop that." A consequent event can also be nothing. For example, just ignoring the child is, in essence, a consequent event.

Tangible and Social Reinforcers

In general, reinforcers are defined by the effect they have on a behavior. You cannot say that an M & M is a reinforcer, if, by giving a child an M & M for saying "red," the M & M has no effect, and s/he doesn't say "red" again. It has to increase the probability that that behavior will occur again. To be a reinforcer, the stimulus or event has to be delivered immediately after the response, and it has to increase the probability that that response will occur again. You can't assume that something is going to be a reinforcer; it has to be demonstrated. Social reinforcers are praise kinds of statements "Good boy, you did it," "That's great," smiles, hugs, pats, all the things that you can't hold with your hands. Tangible reinforcers, on the other hand, are the M & M's, the juice, toys, etc., things that the child can hold.

Now we will discuss different kinds of teaching strategies or methods which involve training the child.

Shaping

When we refer to shaping techniques, we're referring to the act of reinforcing successive approximation to a target behavior. Now, that statement uses a lot of extra terminology that hasn't yet been defined. Target behavior is that behavior which you choose for the child to demonstrate at

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the end of training. That's your terminal goal, your target. If you want the child to grasp, and s/he only has one small portion of that target behavior (e.g., the child will only tolerate touching the item) you will work to train the child to enclose the item in his/her fingers and reinforce tighter and more complete grasping. Again, you will be reinforcing tighter and tighter grasping, hence, successive approximations toward the target behavior.

Chaining

In discussing chaining, we are referring to a training procedure which involves a fixed chain or a fixed sequence of responses, in which one response in that chain serves as a cue for the next response. When you are brushing your teeth, picking up the toothbrush is one response in that chain, and depending on what your set habit of responses might be, picking up the toothbrush could be a step in the chain that is a cue for turning on the water, or a cue for putting the toothbrush under the water. A behavioral chain then is a set sequence of events.

Cues

In a broad sense, cues can be any kind of signal for a behavior to occur. They can be verbal or nonverbal——any instruction, anything that signals or sets the occasion for the child to respond to something. Now an antecedent event may be a cue as in the example given earlier, but not always. Remembering our earlier discussion that antecedent events may or may not be planned, an antecedent event is not always a planned cue, while a cue is *always* a planned antecedent event.

Fading

There are two kinds of fading techniques that we will discuss. The first one involves fading out or reducing the amount of your physical assistance to the child, so that the child does more and more on his/her own. Another kind of fading is fading the reinforcer. Frequently, when you first start training a behavior, you reinforce it *every* time it occurs. You give the child lots and lots of praise, lots and lots of goodies, or whatever you are using to get him/her to increase the rate of that behavior. Gradually though, as that behavior becomes more constant, you should not rely on that constant delivery of a reinforcer. You don't want to have to praise him/her every single time s/he does something right; you don't want to have to give him/her an M & M or a drink of juice *every* single time, so you fade out the reinforcer. You gradually reduce the amount or the frequency of the reinforcer that is given for that task.

Correction Procedures

Other things that we need to consider are correction procedures. Too often we get very far along in our program plans and we never give much consideration in advance to what we will do when that child makes a response that is incorrect. What are you going to do when the child makes an error? You need to specify ahead of time just what type of a correction procedure you are going to use. You need to determine what type of a correction method would be the most functional for your program without losing the attention of the child. You need to specify the correction procedure as part of your program plan.

Stimulus Control

The concept of stimulus control involves several important concepts we need to explain. One of these is "discriminative stimulus." A discriminative stimulus is any stimulus or event in whose presence a response will be reinforced. For example, when you are driving down the street and you see a red light, that is an S^D, a stimulus for you to stop. If you stop, you are, in essence, being reinforced by not being hit. If you go through, that is an incorrect response and you are taking your chances of getting punished. Again, the S^D is a discriminative stimulus, a stimulus that is a cue for a response to occur that will be reinforced. Stimulus control involves control of a behavior which in the presence of the S^D is reinforced, but in the presence of an S delta, or a nondiscriminative stimulus, that response will not be reinforced. For example, you're working with a child and you have a cup and a shoe out on the table. You say, "Show me the cup," the cup is the S^D. The child picks up the shoe. That is an incorrect response; s/he will not be reinforced for that. If s/he picks up the cup, s/he will be

reinforced. The discriminative stimulus, then, sets the occasion for a particular response. The occurrence of that response will be reinforced.

Verbal and Motor Imitation Training

In essence, when we talk about verbal and motor imitation training, we are talking about a *teacher or trainer, first of all, demonstrating or* modeling what the child is to do. The second part of that training procedure is the child emitting some response, hopefully, a response that approximates the demonstration, and the third part, the consequent event, being hopefully, reinforcement for an appropriate imitation of the model. Imitation training can be either verbal or motor. Remember it is basically a three part procedure, the model, the child response and the reinforcer for that correct response.

The definitions that you've been given may or may not be exactly like those of the various textbooks and resource people you may encounter. But basically, these are the ones that we have found to be pretty constant among several different resources.

II. REINFORCEMENT PROCEDURES

This lecture is concerned with how to motivate handicapped students. In order to ensure that handicapped children perform at an optimal level, positive reinforcement will usually be necessary. In short, motivating students is usually connected in some way to providing positive reinforcement. It is unrealistic to assume that an individual, handicapped or not, will perform a task for extended periods of time without some form of pay-off. Even those who greatly enjoy their work would rarely stay on the job with no remuneration.

What special educators must learn is how to use principles of reinforcement to their advantage in the classroom. There is little doubt that rewards have been used for years by teachers. Sometimes rewards have been used correctly and at other times in a less than optimal fashion. This lecture will provide a description of guidelines which are relevant to using positive reinforcement. This will involve how to select different types of reinforcers, specific ways in which reinforcers should be given to children, and how children can be taught to reinforce themselves.

Positive Reinforcement

Positive reinforcement refers to an increase in the frequency of behavior when followed by a pleasurable event or stimulus. Positive reinforcers may be money, food, attention or any event which is instrumental in increasing the occurrence of behavior. While the terms, reward and positive reinforcer, are frequently used interchangeably, an important distinction between the two should be made. A reward is only a positive reinforcer if the behavior it follows increases in frequency.

For example, a child may consider candy or soda pop a reward for performing a certain behavior like cleaning his/her room. However, unless delivery of the candy following the cleaning of his/her room increases the regularity of this behavior, the candy would not be considered a positive reinforcer. A positive reinforcer has the functional effects of increasing and strengthening behavior.

Positive reinforcers fall into two basic categories: primary and secondary. Primary reinforcers are those events which do not require special training to become reinforcing to the individual The need for food, water, or sleep are basic needs of all individuals and are examples of primary reinforcers.

Secondary reinforcers are the other broad category of positive reinforcers. They correspond to the type of reinforcement found in everyday life. Secondary, or conditioned, reinforcers are events which gradually acquire reinforcing value through a pairing with other events which are already reinforcing. Through repeated presentation of a neutral event prior to, or along with a reinforcing event, the neutral event eventually becomes a reinforcer. Examples of secondary reinforcers may include money, tokens, praise, special privileges, or activity reinforcers (e.g., special play time).

The Premack Principle

The Premack Principle (1959) is a further example of a secondary reinforcer. Based on experimental research, the Premack Principle states that, in any two activities which an individual

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engages, the more frequent one may serve as a reinforcer for the less frequent one. For the child who has discovered the pleasurable aspects of play and engages in frequent use of leisure time (high preference activity), play may be an effective reinforcer for increasing the amount of study time (low preference activity) or frequency of "good" behavior.

One of the obvious advantages of the Premack Principle is that it is a natural type of reinforcer and does not require the use of food or liquid reinforcers. Furthermore, it is a relatively easy reinforcer to identify through extended observation and evaluation of the child's daily activities.

The Role of Contingency Management

A contingency is the relationship between a behavior and the events following the behavior. This relationship is crucial in most behavior training programs. This has been readily demonstrated in a study conducted by Redd (1969). Children learned rapidly to discriminate between teachers who delivered reinforcement *contingently* for appropriate play and social behavior, and teachers who gave reinforcement noncontingently.

Types of Reinforcers

Edible Reinforcers

A child who engages in appropriate behavior may receive consumable items. Frequently used examples of edible reinforcers include candy, fruit, juice, milk, and snacks. Edibles have enjoyed widespread use with children who are severely handicapped and continually exhibit a lack of responsiveness to natural reinforcers such as attention, approval, free play time, etc.

Edible reinforcers have been extremely effective in developing language, self-help, and social skills in autistic children (Lovaas, et al., 1973) and severely and profoundly mentally retarded individuals (e.g., Gibson & Brown, 1976). They are optimally used when:

1) the child is hungry or has not just finished eating;
2) the child has demonstrated a definite preference for food and/or liquids;
3) administered in small amounts;
4) administered with social reinforcers at the same time;
5) they can be consumed rapidly by the child and do not take several minutes to eat.

It should be recognized that edibles represent a basic means of motivation, and in fact, should only be used when no other consequences are successful. If edible reinforcers are used for too long the child may become dependent on food for each task. Another limitation may involve preventing those children who are not receiving edibles from becoming upset and disruptive. When reinforcement systems are developed appropriately, however, this is usually not a major consideration (Christy, 1975).

Activity Reinforcers

There are a variety of activities which are frequently reinforcing to all ages and levels of handicapped students. These include such events as extra time at recess, helping the teacher, going home early, free play time, use of the television, or use of phonograph headphones. In order to be effective, activities must be provided *contingent* on the performance of the target behavior(s).

Activity reinforcers may be used with students who appear nonresponsive to all types of events. A mentally retarded adolescent who we will call Gary had had his way at home and in school most of his life. He was now, however, being trained to learn vocational skills and become prepared for a work-study program. Unfortunately, Gary would become extremely stubborn when demands were placed upon him and refuse to work for any substantial period of time. Many items were tried as reinforcers and although Gary would accept them willingly they had no significant effect on his behavior. Careful observation, however, did indicate that he would spend long periods of time sitting in the beanbag chair. It was hypothesized that this was a reinforcing event. Gary was allowed to sit in the chair for five minutes contingent initially on 15 minutes of on-task work. Although this time span was gradually expanded, the sitting "activity" in this case proved effective in strengthening work behavior. This is also an illustration of how the Premack Principle was applied in this classroom.

Social Reinforcement

Social reinforcement is praise or special attention given for desired behavior or performance. It is the type of reinforcement which tends to govern the interpersonal relationships between most people, and is no less effective with handicapped students. The advantages of social reinforcement have been summarized by Kazdin (1975):

1) social reinforcement is easily administered by change agents;
2) social reinforcement can be delivered without disrupting the behavior;
3) attention and praise are more natural types of reinforcers.

Panda (1971) has suggested that social reinforcement provides two functions for the child: it gives informative feedback and also creates a positive feeling (effective feedback) in the child. Panda and Lynch (1972) have identified a major problem in the administering of social reinforcement which should be observed. This basically revolves around the lack of expression, or matter-of-fact manner in which praise or attention is given. Particularly with the lower-functioning handicapped children, the need for affective praise and physical reinforcement is critical. The teacher must become visibly excited at the child's success. Without expressive reinforcement, the child will not become sensitive to the teacher's response to his/her success.

For social reinforcement to be effective, teachers must clearly identify which behavior(s) is to be reinforced. Reinforcement must be expressive and immediate, and inappropriate behaviors should be ignored. Frequently in large groups peers will reinforce a child's inappropriate behavior through attention. When this happens, the teacher should look to children who are behaving appropriately and reinforce them immediately. Withholding attention for "bad" behavior is a critical aspect of having the child discriminate between what type of behavior will result in attention and ignoring.

Token Reinforcers

The implementation of a token reinforcement program begins with the identification of behaviors to be altered. Tokens may be chips, happy-faces, stars, money, checks on an index card, or any other tangible item which represents back-up reinforcers, i.e., items or activities which the child may receive in exchange for token reinforcers. There are a number of advantages to implementation of a token economy in a classroom with disruptive children who are off-task or highly distractible. For example, token reinforcers:

1) bridge the delay between the target response and back-up reinforcement;
2) permit the reinforcement of a response at any time;
3) may be used to maintain performance over extended periods of time when the back-up reinforcer cannot be given;
4) allow sequences of responses to be reinforced without interruption;
5) maintain their reinforcing properties because of their relative independence of deprivation states;
6) are less subject to satiation effects;
7) provide the same reinforcement for children who have different preferences in back-up reinforcers;
8) may take on greater incentive value than a single primary reinforcer.

Although some teachers feel that token reinforcement in classrooms of handicapped and nonhandicapped children are unfair to those students not receiving tokens and may subsequently lead to more behavior problems, a careful study performed by Christy (1975) on this subject did not support this notion. In fact, it was found that the behavior of peer observers remained the same or improved.

Designing a Token Reinforcement System

The first step in devising a token economy for a group of children is to select the behaviors which will earn tokens. When the behaviors that earn tokens are specified, the teacher knows when to give tokens, and the children will know what to work for.

In identifying behaviors that earn tokens, it is necessary to specify quality of work as well as quantity of work. Initially, it will be best to provide token reinforcement frequently; however as the child becomes more independent the behavioral requirements for tokens may gradually be increased.

For example, assume the children only work successfully for 30 seconds at a time. When this criterion is met, you can move on to 60 seconds of on-task work for one token. At a later point, the children might work 10 minutes for three tokens.

The second step involves developing a list of back-up reinforcers. This is also called a reinforcement menu. Three classes of back-up reinforcers may be considered:

Food	Activities	Play Materials
Gum	Swinging outside	Make-up kits
Candied cereal	Extra lunchtime	Boats
Peanuts	Helping teacher water plants	Cars
Raisins	Leading class	Dolls
Chocolate kisses	Take attendance slip to office	Balls
Lemon drops		Yo-yos
Raisins		Play dough
Apples		Coloring books
Lollipops		Painting sets
		Beanbags
		Puzzles

By involving the children in developing the reinforcement menu there will be a greater likelihood that the events will be more motivating. The menu should be changed weekly to avoid satiation of items and there should be only 10 to 15 items at a time.

Once behaviors are identified and reinforcers are selected, prices and wages must be established to relate the two through tokens. In setting prices, begin by selling store items at a reasonable price which, hopefully, is in accord with retail store prices. Eventually, the reinforcer menu will have the number of tokens required next to the reinforcer so that students will have an expectation of how many tokens they may earn. Adjustments in prices will have to be made as it becomes evident which items are more popular.

Once the teacher has established what type of token reinforcer (checks, plastic chips, etc.) will be used, then the system must be explained. With young children, start by handing one token out to each child and then requiring the children to use the tokens to get some treat. After several pairings like this, they should begin to get the idea. With older children, instructions alone may be necessary.

When giving out the tokens, tell the children what they have done to earn them. It is important to focus on the behavior and not the tokens.

Initially, a token exchange can occur daily but with older children a weekly exchange may be sufficient. The purpose of the exchange is to let the students know they are improving and doing a good job.

The structured contingencies which a token system provides are critical in the successful mainstreaming of most handicapped children. In developing new skills or managing inappropriate behavior with handicapped students, it is important that the child be aware of the expectations being placed on him/her. A token economy system allows for careful specification of appropriate behaviors and positive consequences which should maintain those behaviors.

In getting the handicapped child off the token system these guidelines should be followed:

a. reduce the frequency with which tokens are given and increase behavioral requirements
b. reduce number of tangible items available on menu
c. increase amount of social reinforcement and praise
d. increase length of time between receipt of tokens and exchange time.

These methods, if done gradually, will move the child back to a more normal classroom arrangement. It is important that a planned followthrough and maintenance program be devised so that the child is not indefinitely working for tokens.

Selection of Reinforcers

Direct Observation

By careful observation and recording of the child's behavior in the natural environment, it may become apparent which types of items and activities are preferred. As noted in the case of the adolescent, not all handicapped students will respond to the same types of reinforcers. Candy, praise, and grades may not be effective in motivating the child. If the teacher records the type of foods and liquids which the child normally prefers at mealtimes or the toys which are played with most frequently, this can serve as an effective means of assessing items which may prove to be potential reinforcers.

Interviewing

Parents and other family members may also be interviewed in order to investigate which items and activities the child prefers. Since parents spend far more time with their child, frequently they have much more information about consequences which will motivate the child. A structured interview in the home can provide teachers with another source of locating effective reinforcers.

Testing for Reinforcers

If the previously discussed methods are not successful, it may be necessary to set up a more structured assessment. Systematic testing and recording will facilitate reinforcer selection.

There are several steps involved in testing for reinforcers. The first of these is to pick out a number of items such as a peanut, cereal, marshmallow, an M & M, and a spice drop. You should have at least five. Allow the student to sample one of each of those items. After one of each of the items has been consumed, place the items on the table in front of him/her so they are approximately four inches apart. They should be within easy reach. Each item should then be pointed out one by one to make sure the child attends to the fact that there are five items in front of him/her. The child can then choose one. This is done through a verbal cue (if the child's receptive language is good enough) such as "Take one," or "Pick one." If receptive skills are limited, gentle prompting of the child's arm toward the table may be done. After an item is selected, record on a data sheet which item was chosen. The order of the items should then be switched around, so that the items are not in the same position that they were during the previous trial or presentation. This is done because some children have a dominant hand preference, or they have position habits (they consistently choose an item that is to the right or to the left of them depending on the hand preference). It is necessary that the items are randomized so that the position habit is controlled.

This system can also be used to test for preferred toy items. Toys that are small enough can be placed on a table. Larger ones can be placed on the floor in front of the student. The same procedure is followed for testing toy preference, the only difference is that instead of allowing the child to consume it, you simply allow the child to play with each of the toys about thirty to forty-five seconds. Take the first toy away and present the child with the next toy until all have been manipulated. As s/he selects each toy across the fifteen trials, randomize the presentation again, but make sure the child is allowed about a minute to play with each toy that is selected. This is done so the child doesn't feel punished for choosing a toy. It is important to allow enough time to play with it so that it serves as a reinforcer.

One possible problem with this procedure is that some children will see the whole array of edibles on the table in front of them and grab frantically, scooping up three or four items at a time. To

prevent this, obtain a piece of cardboard that is about 11 inches by 13 inches or bigger, and place it between the child and the items. In this way grabbing can be prevented and it will not be necessary to worry about physically restraining the child.

If liquids are being sampled as part of the edible reinforcers, only give the child a small amount in a glass. If a whole glass is given, there may be a higher rate of toilet accidents.

A source of additional information regarding reinforcer testing can be gained from the following: Number the positions in which the items are placed. Number the edible furthest to the student's right No. 1, and then number across 1 to 5. Record on the data sheet the number of the chosen item corresponding to its position in front of the student. What may occur is that the child will reach consistently to the midline or that the child may *not* ever cross the midline to choose an item. The child may always choose those items from the middle to the right, or to the left. This numbering system cues you to this behavior.

Typical questions: One question which is frequently asked by teachers is: How long should a reinforcer be used in a program? This is answered in the following way: If two types of stimuli are about equally reinforcing (out of 15 trials, one may be chosen seven times, another, eight), use both of these items randomly. If a child definitely has one preference (14 out of 15 trials on consecutive days), use it until the data from his/her programs starts to look bad - the child's performance will deteriorate. Another reinforcer test may be conducted at that point. With the use of edibles however, it is wisest to combine them with verbal praise and affection, while trying to "wear" their use.

Reinforcer Sampling

Another means of identifying reinforcers for educational programs is through providing children with *new* items or events. Many handicapped children, particularly those from low-income, inner-city areas, have not been exposed to activities, toys and edibles which might prove to be highly motivating. It may be beneficial to expand the range of events which may be reinforcing to the child.

One illustration of how reinforcer sampling might be used during playtime would be in presenting the child with a variety of cause-effect toys. These play materials often require brief instruction before children understand their reinforcing qualities.

Reinforcement Menus and Schedules

A reinforcement event menu may consist of a large board with a number of high preference activities represented by stick figures or other symbolic figures to indicate the different reinforcing activities available (Addison & Homme, 1966). This is one method of presenting a variety of reinforcer options to the child. It also has value because it can be observed and is not totally abstract. Colored Polaroid pictures or illustrations may be used to make the board more attractive and meaningful to younger children or the severely retarded child.

Delivery of Reinforcement

Once reinforcers have been selected and target skills chosen for instruction, then the teacher must consider how reinforcers will be delivered. There are a number of factors which must be carefully adhered to if the reinforcement program is to be effective. These points are discussed below.

Immediacy of Reinforcement

Reinforcement must be immediate if it is to succeed. Many studies have confirmed that even a 10- or 15-second delay in reinforcement is too great for effective conditioning. Moreover, the reinforcing effect is associated with whatever behavior is ongoing during the moment immediately preceding the onset of the reinforcer. A delay of more than a few seconds often results in the diversion of a child's attention from work. If a child completes a task, sits half a minute, and begins to daydream, then gets a reinforcer, it is daydreaming rather than on-task behaviors that will increase in its subsequent frequency.

Immediate reinforcement is important in the early stages of an educational program when the target skill is developing. After a response is performed consistently, the amount of time between the response and reinforcement can be increased without a decrement in performance. For example, in

classroom settings students sometimes receive points or candy daily while high rates of academic behavior develop. However, after behavior has stabilized, the reinforcers can be delivered every other day or at the end of several days without a negative effect on performances (Cotler Applegate King, & Kristal, 1972). If a program begins with delayed reinforcement, behavior might not change at all or as rapidly as when reinforcement is immediate.

Reinforcement Schedules

Reinforcement may be given on one of two types of schedules: continuous or intermittent. A continuous schedule of reinforcement requires that a reinforcer be delivered for each correct response made by the child. Continuous reinforcement schedules are the quickest way to develop behavior, but are frequently impractical in classroom settings in which there are many other children. Giving reinforcement for each correct response presents a number of logistical problems, and is not a very realistic analogy to normal reinforcement conditions in the natural environment. Furthermore, behavior which is continuously reinforced tends to decrease very rapidly if reinforcement is immediately withdrawn.

On the other hand, intermittent reinforcement refers to reinforcers being delivered only after a certain passage of time or certain number of correct responses are emitted. Intermittent reinforcement schedules correspond to the natural environmental conditions of reinforcement which we face daily. Examples of intermittent reinforcement include receiving a paycheck each Friday, gambling behavior (e.g., not knowing when to expect payoff), or an occasional compliment by a parent to children for good behavior. Behavior which is reinforced on an intermittent schedule is more durable, and is maintained longer than behavior which is reinforced continuously.

It should be noted at this point that there are more sophisticated types of intermittent reinforcement schedules. These include fixed interval, fixed ratio, variable interval and variable ratio schedules as well as chained, multiple, and concurrent schedules (Whaley & Malott, 1971). These schedules are, by and large, impractical for the teacher to follow. The interested reader is referred to the Primer of Operant Conditioning by Reynolds (1968).

Amount of Reinforcement

The amount of reinforcement delivered for a response also determines the extent to which a response will be performed. The greater the amount of a reinforcer delivered for a response, the more frequent the response. The amount can usually be specified in terms of quantity of food, number of points, or amount of money.

Although the magnitude of reinforcement is directly related to performance, there are limits to this relationship. A reinforcer loses its effect when given in excessive amounts. This is referred to as satiation. When teachers find effective reinforcers they should not "abuse" them by overuse. Rather, new reinforcers should continually be sought out in order to expand the range of positive consequences which the child may work for.

The effect of the amount of the reinforcer on a child's behavior will depend upon: a) the satiation state and b) the deprivation state of the child with respect to that reinforcer. For example, individuals who are temporarily deprived of adult attention are more responsive to attention than are those who are not deprived of attention (Gewirtz & Baer, 1958). Similarly, children will be more responsive to food reinforcers before mealtime instead of after eating.

Pairing

Pairing reinforcers refers to giving two reinforcers at approximately the same time or in close temporal proximity. As noted earlier, this is an excellent means of strengthening reinforcers and expanding the range of events or stimuli which the child finds reinforcing.

Here are several examples of how reinforcer pairing should be performed by a teacher:

Skill	Pairing Reinforcing Consequences
1. Child eliminates in toilet	a) Fruitloop given b) Praise and hug
2. Child completes 10-minutes of "on-task" work	a) Token given b) Praise given
3. Child self-initiates on jack-in-the-box toy	a) Jack-in-the-box pops up b) Teacher and peers applaud

With the pairing of two consequences, each reinforcer strengthens the other. This is an excellent means of fading the use of artificial reinforcers, such as food and other consumables and replacing them with "intrinsic" reinforcers, i.e., praise, toy play.

Labeling Reinforcement Contingencies

When a handicapped child acts in an appropriate manner or begins to acquire a desired skill, the teacher must reinforce this behavior. However, it is critical that the child be told *why* s/he is being reinforced. A common drawback of many education programs is the failure of teachers to label the reinforcement contingency placed on the target behaviors. For example, if a teacher is encouraging cooperative play between two children that frequently fight with each other, then any approximation of appropriate social interaction by either child should be reinforced with: "Good playing with Johnny!", and a pat on the back or hug. Severely handicapped students may not connect the positive reinforcement consequence with the desired behavior unless the contingency is labeled.

It is important to be specific in selecting the skill which is being reinforced. The child will respond more consistently if the teacher is also consistent in providing reinforcement for selected target skills.

III. SHAPING PROCEDURES

Time

Ten minutes

Script

In general, the teaching procedures we will be discussing are seldom used in isolation. For example, you would seldom use a strict shaping procedure without using any fading. They will be explained in isolation to you merely for clarification. Please don't get the idea that you can't use them in combination or that you can't use one as your primary teaching strategy and another as a correction procedure.

Shaping is a procedure involving a selection of a behavior that in some way approximates your desired target behavior. You then differentially reinforce successive approximations or closer perfections to that target behavior. Most of the time that we are discussing shaping, we will be talking about *response shaping.* There are other kinds of shaping but basically the things that you will use the most are response kinds of shaping where you actually are shaping or working with a child's motor response. Remember that differential reinforcement involves two or more possible responses on the child's part and one is reinforced in the presence of a certain stimulus cue, or instruction and the other is not. You *differentiate* between the responses that you reinforce. One is O.K. and the other is not. Questions? There will be many different degrees as far as levels of shaping in your classrooms, but an example of a behavior that we have shaped is head control——a child can hold his/her head up for a few seconds but then it drops down very quickly afterwards. You can shape his/her head control response. You can increase the time s/he holds his/her head up appropriately by gradually requiring him/her to hold it up for longer periods of time before s/he gets reinforced. If s/he holds his/her head

up two or three seconds on most days, then you would reinforce that initially. That is the child's initial approximation to the behavior and you would reinforce it. Two or three days later you might change to five seconds before s/he gets reinforced. So you gradually increase the duration of time s/he must hold his/her head up before s/he gets reinforced. Another example is putting on T-shirts with children and using a backward chaining kind of format where the T-shirt is put on except that the child has to pull it down. This particular program involves physically guiding the child through or physically assisting in which the teacher puts his/her hands on top of the child's hand and pulls it down, then gradually s/he uses less and less of his/her physical prompt. So s/he was shaping that child to do more and more of that behavior of that program step independently. The child that you saw in the wheelchair with the ball and the comb has a positioning wheelchair. This means that the straps went over her chest and over her waist and down her feet. One thing that her teachers have been working on with her is undoing those straps by herself. There is a walker for her in class and she is not left in her wheelchair during the class period. You need to change these children's positions frequently during the day and they need to gradually become more and more independent as far as getting in and out of their own wheelchair. At first the girl was reinforced for just pulling down one strap and now she is doing all the straps independently. This behavior was shaped, one strap at a time so that she got reinforced for pulling down one strap and two or three days later she had to pull down two straps and this gradually increased to the waist strap and then the feet. Now she is independently doing the whole sequence of undoing her own wheelchair straps. There are some problems with using shaping techniques though this is frequently the procedure you have to use with these children. A lot of the responses, a lot of the steps in shaping are very difficult to define. Given the T-shirt example, if you are talking about the teacher holding on or giving some degree of physical assistance to the child to pull that T-shirt down, it's hard to define how much assistance is given. It's difficult to specify the degree of pressure s/he is having to put on that child's hands to even keep them on the T-shirt, much less pull it down. Because it is hard to define it is also hard to reliably observe. as getting in and out of their own wheelchairs. At first the gril was reinforced for just pulling down one strap forcing the child to be put through that response. However, s/he might not feel that way at all because s/he is actually the one that is holding on. S/he might have a different interpretation of the level of responding of that child. S/he might be feeling very sure of the fact that the child is almost ready to pull it down by him or herself, where it appears to me, a naive observer, that the child still needs a lot of assistance. It's also difficult sometimes to maintain consistency. For example, on day two of the program you might reinforce one level of performance and give one level of assistance. By the time the weekend rolls around, though it is just the third day of training, it's a little difficult to remember how much assistance you gave if it is not well specified. It is hard to maintain some consistency as a teacher with that kind of response, but it is very important that you do so, if shaping is to succeed.

IV. CHAINING PROCEDURES

Time

Fifteen minutes.

Instructions to the Facilitator

Present the following lecture adding any examples of chaining from your experience. Ask for questions periodically during the lecture and encourage participants to generate any examples of chaining they may have used.

Script

Shaping and chaining differ in several ways, the first of which is that shaping is used to build up a single response while chaining is used to link together a series of related responses that are already established. Chaining is used when a child has the beginnings of a behavioral repertoire but s/he may not have those responses in the correct sequence to perform a particular behavior. For example, if we

were trying to teach handwashing, a child may know how to turn on the water, s/he may know how to get a drink for instance; and s/he may be physically capable of a pulling response to get a towel out of a dispenser; s/he may be capable of doing most of the individual responses that it would take to wash his/her hands, but s/he does not do them in sequence. So, in this case you would use a chaining procedure to establish the relationship between the steps in the sequence.

Each step in a chain should serve as a cue to perform the next step. In time it will also take on reinforcing qualities for performance of the previous step, so it serves a dual function. Every step in the chain serves not only as a cue, but also as a reinforcer. It takes on reinforcing qualitites by being paired with completion of the chain which brings about the delivery of a reinforcer.

There are a variety of ways you can combine shaping and chaining. Using the handwashing example, if you are training a child who is able to turn on the water and pick up the soap, but doesn't actually have the response of doing the actual scrubbing behavior, you can use a shaping procedure. You can use a shaping procedure in isolation and take the child to the sink every day, turn on the water for him/her, do all the other steps, and just give him/her the soap and shape this response (where you might gradually increase the closeness of his/her hands and the length of time that s/he spends rubbing them); or you can incorporate shaping into your chaining procedure and when you get to that step you shape the individual responses that the child lacks. Now, of those two procedures probably shaping within the chain is the more desirable. If the child already has some of the other responses in the chain they can be maintained by going through the chaining procedure every day.

There is some disagreement between authors as to whether backward chaining and forward chaining are both chaining. Some authors describe chaining as proceeding in a backward direction only. There are, however, two directions in which you can chain a series of responses together. Let me show you an example of a task analysis. (Put transparency on here.) This is a 24 step handwashing program. If I were to use backward chaining to train this program I would put the child through the first 23 steps and work on disposing of the towel in the waste container. If I were to use forward chaining, I would train on the first step and put the child through the rest of the responses without requiring him/her to perform very much. That is the difference; the direction in which you chain.

Before you can even begin talking about a chaining procedure, you have to have a very clear cut task analysis with your program steps well defined, and well broken down. That is a prerequisite to training. You must have a consistent series of steps that you follow at each training procedure, or you will never get your chain established. If you occasionally do the chain in a different sequence, you have lost it. You have to do the steps every day in the same way; the same sequence.

Backward chaining is, in my opinion, preferable to forward chaining for several reasons. If you are trying to build up each step in the chain to serve both as a cue and as a reinforcer, you start at the end of the chain. The process of establishing each step as a reinforcer will be more logical. It makes more sense to complete the behavior and be reinforced for it and then build in the opposite direction. To work on the first step and then put the child through the remaining steps leading to reinforcement makes the relationship between the reinforcer and the response too delayed. Establishing each step as a reinforcer for completion of the previous one is more effective going in a backward direction. Another reason that backward chaining is more efficient and more acceptable than forward chaining is that if you're training a response such as shoe tying, and you go in a backward chaining strategy, when you complete the program the child's shoe is tied, and you go on to another task. If you are going in a forward direction, you may be just training the child on the first step and you put him/her through the rest and then the teacher has to go ahead and complete the responses for the child. It is less logical for the child to be passively put through the rest of the responses. It makes more sense to complete the response and reinforce the child at the completion of it. That helps it to take on more reinforcing qualities.

Forward chaining does work. We are using it in our classroom with the shoe tying program so we can show students an example of the forward chaining procedure. It is slower than backward chaining, at least in this example. We have four students in the shoe tying program and it has taken about three months to establish the first three steps.

There isn't any clear cut definition or set of rules to follow in choosing backward versus forward chaining although there appears to be a lot more support for using backward chaining over all.

In actual training using this technique, you would put the child through the first 23 steps in the

program by physically molding his/her hands through performing all the responses. This gets to be a tiring procedure for the teacher. If the student attempts to perform any of the steps or if s/he already has some well established and starts to do them on his/her own, allow him/her to go ahead. Don't physically hold the child in such a way that you are in total control. If s/he starts to do any of the steps on his/her own, go ahead and let him/her perform them, but make sure that you provide close physical guidance so that if s/he starts to do the next step out of sequence, you can interrupt it or prevent it from happening. Make sure that the child is given close enough physical guidance so that s/he performs the steps consistently at every teaching session. You should socially praise the child during completion of the chain for cooperation, some children get really physically resistive, so if you get a cooperative child, make sure that you reinforce that while you are putting the child through the initial steps of the chain.

The one major problem with chaining and descriptions of it in the literature is that this technique is not used in isolation. Chaining alone doesn't tell you how to train the step that you are targeting. You train one step at a time, and it tells you the procedure of putting the child through all the other steps in the chain, but it doesn't tell you what to do when you get to that last step. You can give the child a verbal cue; you can do a variety of things, you can use a shaping procedure, but you need the addition of a systematic teaching procedure on the step that you are actually training. So chaining in itself it not enough, it does not give you enough direction to go ahead and use the technique on its own. If we were to use a verbal cue to prompt the final response in the chain, the cue would consist of "wash your hands" rather than "throw away the towel." What you are trying to do is establish the entire sequence of responses in the chain, so rather than cueing each step specifically to what the behavior is, you would give an overall cue to the whole sequence of responses. At the completion of your training, the cue "wash your hands" would mean a whole series of responses to perform and not just the verbal cue of "throw the towel away."

Regarding a criterion for chaining, we usually require that performance of the last step be done with no help for

Regarding a criterion for chaining, usually require that performance of the last step be done with no help for three days or for three sessions (depending on how many sessions you run per class day) before we work on step 23 and 24 together. So after completing step 24 three days in a row, you would then put the child through the first 22 steps of the procedure then allow the child the opportunity to dry his/her hands. If s/he doesn't, train on this step, and s/he should automatically perform the last one. If s/he does not perform the last step, then something has broken down in your chain and you haven't run enough trials or enough sessions to get the last step in the chain established. You gradually build in a backward direction where you train fewer and fewer steps as the child has mastered them; beginning with the final ones in the sequence and moving one step at a time.

V. FADING PROCEDURES
(Both Fading Reinforcing Stimuli and Prompts)

Time

Twenty minutes.

Instructions to Facilitator

Present the following lecture adding any examples of prompts and fading from your experience. Ask for questions periodically during the lecture and encourage participants to generate any examples of prompts and fading they may have used.

Script

Shaping, chaining, and most of the other teaching methods used with the severely handicapped involve training one step at a time. In chaining you train either the first step or the last initially and move in either direction. There is another way to go about training that we have named. I have never head it talked about in the literature; but it is called *total cycle*. What this means is training every step

in a task analysis at every training session. This can be done with a variety of teaching strategies; it is just an overall approach to training that is a little bit different than the traditional chaining as a teaching strategy. Total cycle involves beginning with a task analysis, and then determining a series of prompts or cues that you are going to use to train each step. You then go through every step and offer training on each step. (I'll go over this a little bit more when we get to correction procedures.) You can use a variety of sequences of prompts and offer training on every step in the sequence at every training session. I don't want to give you the impression that you have to chain everything in any one training session that you work, only on one step of a particular sequence.

I would now like to talk about *prompts* and the various types of prompts that a teacher might utilize. The first class of prompts are those that are verbal. These may be just the name of a step or the name of a chain such as "shoe on" or "turn on the water." Any kind of verbal cue that a teacher delivers to a student is a verbal prompt. Try to keep your verbal cues limited by the number of words that you use. It is very easy to get into what I call "verbal garbage." It is a lot of excessiive verbalizing on the part of the teacher that the students don't cue in on; it seems to be confusing.

Other kinds of prompts that can be utilized are those that are gestural. This can amount to pointing, (in a handwashing program you might point to the bar of soap, or if you tell a child to sit down you might point to the chair where s/he is supposed to sit) as you givethe verbal cue. They can be used either by themselves or in combination with a verbal cue to give added input as to what the child is supposed to do. Gestures can be done in a sequence where the teacher might initially tell the child what s/he should do and then offer some kind of a gesture as an intermediate prompt if the child does not respond correctly. Another gestural prompt you might use is to tell the child to sit down and tap the chair where you want him/her to sit instead of just pointing to it. The child might not cue into it with a point alone. You can give him/her some auditory input, such as loudly tapping the chair, along with the visual prompt that might serve to give the child a better idea of what you want him/her to do.

The third level of prompting is modeling or demonstration where you actually demonstrate what you want the child to do. When you use modeling in an attempt to get a child to imitate you, it is better if you use a single consistent cue. If you are going to teach the child to respond to "do this " then use that consistently, rather than providing him/her with an extra verbal instruction. I think it facilitates generalized imitation better across teachers and across settings if you teach the child to always respond to "do this" with attending to you, and then watching what you do and imitating it. Modeling is another way of cueing.

The final way of cueing a child is offering some kind of a physical prompt. We rely on physical prompts frequently with our children because we have very few children in our class who imitate. While we are trying to establish imitation, we are forced to rely on giving some kind of physical cue in order to get the child to respond. Also, if you are going to be working with any visually impaired children you are going to have to learn to rely on physical prompting for the type of cues you give in your program.

Physical prompts can range in intensity from a slight tap on a body part (physically giving the child a start toward performing a particular response) to actually physically molding a child's hand around an object or putting the child physically through the response. There is a range of physical assistance that you can provide.

There are some problems that we have encountered with "putting through" as a teaching strategy. Sometimes teachers become automatic about putting a child through a response. The child doesn't perform correctly so they automatically go in and put the child through and do it over and over again. The teachers are not very sensitive in their use of it so that they can't tell when the child is beginning to respond on his/her own and they can begin to fade out. In this way, you can cause a child to become very dependent upon the physical cues and they become passive. When you try to start fading out your physical prompts, you find the students don't move on their own; they just sit there and wait passively for you to go ahead and put them through a particular response. Some students resist physical assistance and will combat you if you try to physically put them through a response. In this case, a legitimate target behavior for these students would be for them to learn how to be put through a response. That would be the first step you might work on with a particular skill just allowing the teacher to physically mold them to perform a particular step. Putting through takes many

trials to fade out. We encourage you to not rely on it any longer than you need to and be sensitive with your use of it. Don't get into a pattern where you automatically and very ritualistically put a child through a particular response.

The final problem with putting through is if you have to change trainers, it is difficult to define how much force or how much pressure you are exerting on a particular child to get him/her to perform the response. If you are absent or if you can't run a particular program one day and someone else runs the program for you, s/he may not know how much physical guidance you have been giving and s/he may either give more and make the child more dependent after s/he runs the program or not provide enough and the child gets into a failure set where s/he doesn't respond correctly and doesn't get reinforced. There are problems with defining putting through and fading it out

In order to compensate for getting a child to rely on you for manual guidance, there are a couple of things you might do. One of them is called "graduated guidance." This is where you don't give the child any more help than you need to and it requires that you be extremely sensitive to the amount of pressure you are putting on the child in order to get him/her to perform. If the child attempts to resist while you are trying to put him/her through a response, don't try to force him/her. In using graduated guidance you simply prevent the child from moving in the opposite direction by blocking it You don't physically try to force the child to do a response that s/he doesn't want to do. If you attempt to force the child through a physical response, you will sometimes get emotional responses on the part of the child where s/he becomes upset and then you become unpleasant to him/her and the whole session deteriorates. Try not to get involved in physically forcing the child to perform a particular skill.

An intermediate step when you are trying to fade out physical guidance is called shadowing. After you have trained a child to do a particular motor response or a motor imitation task, you shadow his/her movements as s/he is going through the response. You hold your hands and parallel his/her movements within a fraction of an inch of touching him/her and gradually increase the amount of distance between the child's arms (or whatever body part you are talking about) and your arms.

Another way to fade out physical prompting is called spatial fading. That refers to a sequence or a segmented way of removing physical prompting. I have an example that we ran into this summer. We were doing a cutlery sorting program (teaching a student to sort knives, forks and spoons in a pre-vocational task). The student did really well except she would never make the initial response for the first trial. We would have her sort ten knives, ten forks, ten spoons, but we couldn't get her started. After we had initially put her through the first response, she would go ahead and finish but she did not respond to a verbal cue to begin and she didn't imitate. What we ended up doing was, we would say "put these away" and put the student's hand on top of the pile of cutlery. We initially started out by putting our hand totally over the top of hers, then after she performed correctly three sessions in a row (she would go ahead and sort the silverware), we touched her hand with four fingers and said "put these away." We physically took her hand and put it on top of the pile of cutlery using four fingers, then three fingers, then two and finally just touched her hand at the base of the first knuckle of her little finger. We then touched her at the wrists, forearm, elbow and shoulder. We only had to back up once where she ceased to respond and the fading went very quickly. Fading out your physical assistance by segmenting the body parts involved and then gradually getting your focus of physical assistance away from the hand (or whatever the main body part is) to complete the task.

The example I just gave you leads automatically into the next topic and that is fading. A lot of authors and a lot of people in the field talk about fading in different ways. You will find it in different contexts very frequently. People refer to fading prompts, fading reinforcers, and fading program stimuli. One of the problems we ran into earlier was shaping. Some of the people in the audience found it difficult to understand why shaping would work. Shaping by itself is really a long procedure that, in my opinion, often happens by accident. The child figures out what you want him/her to do by chance. You would rarely use it in isolation, almost always combining it with a fading procedure. You systematically require more of the student while fading out the amount of prompting you are giving (usually physical prompting). An example of a fading prompt procedure that is pretty common is in teaching children to imitate. In teaching a child to touch his/her head, you would use a combination of shaping and fading. First of all, you model the response and provide a physical prompt of holding the child's elbow and bringing the child's hand up so that it is level with the child's ear. That would be one level of prompting. When the child consistently went up from ear level and touched his/her head

you might then lower your prompt level to the shoulder. You might have to make intermediate steps in between prompting to ear and shoulder level. The last prompt you might give is just a tap at the elbow to encourage the child to lift his/her arm and complete the response. So in shaping something like an imitative response, you would use both shaping and fading rather than just waiting for the child to randomly come around and touch his/her head. You give the child a systematic prompt that would be well defined in your program and consistently faded out so that someone else coming in and picking up your program could go ahead and demand the same response level of the child, and also systematically give the same amount of prompting.

In fading reinforcers and going from a continuous schedule to an intermittent schedule, it is probably best not to go straight from reinforcing every correct response to reinforcing every other correct response. That may be enough to cause the child to stop responding. What you should do is on your data sheet, or on a piece of paper that you can keep in front of you during the session, indicate which correct response you are going to reinforce. In the first session that you are going to start fading out reinforcers, start by reinforcing the first three correct responses, skipping one, then going to two, then skip one, then every other one. Make sure that you stagger your schedule of reinforcement a little bit so that it is not very sudden.

VI. CORRECTION PROCEDURES

(Graduated Guidance, Backup Procedures, and Putting Through)

Time

Thirty minutes.

Instructions to the Facilitator

Present the following lecture adding any examples of correction procedures from your experience. Ask for questions periodically during the lecture and encourage participants to generate any examples of correction procedures they may have used.

Script

Correction procedures refer to those behaviors the teacher goes through when the child does not respond correctly. The first of these that I want to talk to you about is a procedure that we refer to as the Project MORE teaching strategy. It was developed simultaneously by three different people. O'Brien and Azrin in Southern Illinois, Project MORE in Parsons, Kansas, and Don Horner in Wheatridge, Colorado. It is really a combination of some of the different teaching strategies we have talked about, it is a combination of prompts. What it amounts to is a very systematic way of going through steps in a program where you record how much assistance you are providing the child to perform in a particular step. Depending on what your task is, you start out with what is called a "No Help" stage. In other words, you just allow the environment to elicit the behavior. If you were training a child to wash his/her hands, the first step might be for the child to turn on the hot water, so you would start the program and not say anything for about three seconds. Just place the child in front of the sink and wait for about three seconds. If the child does not reach for the hot water, if s/he starts to run out of the room or pick up the soap or do the steps out of sequence, you would at that point give the verbal cue for completion of the step such as "turn on the water." You then wait again about three seconds. If the child still has not responded correctly or if s/he begins to respond incorrectly, give a demonstration and repeat the verbal cue. Turn on the hot water yourself, turn it off again and wait. If the child still does not respond correctly, repeat the verbal cue again and physically put him/her through the correct response. There are actually four levels to the teaching strategy. The first one consists of no help at all, then go to a verbal cue, to a demonstration and on to a physical prompt if necessary. Go through this same procedure, this series of graduated assistance every step of the program in every session. This can be used with the total cycle teaching strategy where you go through all the steps of a task analysis at every session. It can also be used with backward or forward chaining. Remember when I talked about chaining I said the chaining procedure itself does not provide you with

a concrete systematic way of teaching the single step you are working on at any one time. You can use the Project MORE strategy (or the four part teaching strategy, whatever you want to call it) to train the one step you are working on. During a chain, you would allow the child a few seconds to respond on his/her own. If s/he doesn't do it then give a verbal cue (in this case the cue would be for the total sequence of behaviors like "shoe on"). If s/he still doesn't do it, demonstrate it. If S/he *still* doesn't do it, physically put him/her through the response. You can gradually see improvement where formerly the child may have required physical assistance to accomplish a large number of the steps. The child gradually goes from relying on you for physical assistance through the demonstration phase to relying on verbal cue. The important thing is to give the verbal cue with each level of assistance. This increases receptive language and it pairs the correct response with the verbal cue so that you can get a gradual transition from requiring physical assistance down through a simple verbal cue to elicit the response. It is a very effective strategy. In order for it to be the most effective, give *one* cue at each level of assistance. Give one verbal cue before you go on and give a demonstration (if the child does not respond correctly). Going quickly keeps the child's attention and it prevents a lot of inappropriate behaviors from interfering.

In order to record the use of this strategy, we have assigned a number value to each level of assistance. If the child performed any of the steps in a *no help* phase, s/he would receive a 4; if s/he required a verbal cue, s/he would be given a 3; if s/he required a demonstration, s/he would be given a 2; and if s/he needed to be put through a response, s/he would get a 1. Or you could score 3, 2, 1 and not give any credit for being put through a step. You then determine how many program steps there are to complete the task and multiply that by the highest level of assistance which in this case would be a 4. If you had a 10 step program, and s/he performed all the steps with no help, s/he would get 4 points for each correct performance. The total number of points possible for completion of that program would be 40. You total up the number of points the child gets during any one session and graph that on a scale of 40 to get a very sensitive indication of how the child is progressing. You get a clear picture of the transition from reliance on physical assistance down through just reliance on the environmental cues alone to elicit the responses. It is a good way of measuring progress. You can look at each step each day and see the transition from zero up through 4 to see if there are any steps that are providing you with particular problems. Just the overall number of points every day will give you a clear picture of what's happening.

Another way of correcting a response, and it is something that is easily used with physical prompting is called a backup procedure. Have your prompting well defined like the example we just did with prompting to ear level, then down to the shoulder and finally providing a lift at the elbow. If you were down to the level of prompting a child at the shoulder to complete the response of "touching head," and a child consistently did not perform correctly, the correction procedure in this case (for every trial that s/he did incorrectly) would be to back up to your former level of prompting. A backup procedure refers to going back to a former level of assistance in order for the child to respond correctly. It can be used in a lot of different programs, and is another reason it is important for you to define your level of prompting clearly so that you can utilize a backup procedure.

A frequent need to back up in your prompting could be an indication that you did not set a high enough criteria before you went on to the current level of prompting. If the child, as soon as you start to prompt to shoulder level, consistently makes errors and doesn't complete the response, you may need to return to prompting to ear level, and maintain that for a longer number of trials than you had previously. It may be an indication that the child just is not ready to move on to less assistance or it may be a sign that there needs to be an intermediate level of prompting that you need to add between ear and shoulder at chin level.

Another thing you can do which is very similar to the Project MORE strategy but can be used with children that don't imitate, is simply skipping the demonstration phase of the Project MORE strategy and going straight from the verbal cue to a physical prompt that you have defined. You can substitute some kind of gestural cue (or a pointing response) if it is appropriate for the particular behavior being taught, between giving a verbal cue and physical help.

VII. STIMULUS CONTROL PROCEDURES

Time

Twenty minutes

Instructions to Facilitator

Present the lecture. During the lecture, it may be helpful to have a chalkboard or easel that has the key terms (e.g., S^D) and descriptors you will be discussing (e.g., S^D - discriminative stimulus).

Script

Stimulus control is a condition or something that occurs; it is not a specific training procedure like those we have previously talked about. Stimulus control has been established when a particular stimulus, an S^D, sets the occasion that a response would be reinforced. For example, when you are in the lunch hall with your children and a tray of food has been set in front of one of the children, that tray with the food on it is an S^D, a discriminative stimulus, for that child's response of spoon usage. The 'lights off' during rest period is an S^D or discriminative stimulus for the child to lay down and take a brief nap. The red light at the intersection is an S^D for you to stop. We also need to discuss S-delta. That is a term that is used to denote the stimulus that does not signal that a response will be reinforced. So if you set the full lunch tray in front of the child and the child begins to use his/her spoon, that is an appropriate response in the presence of that S^D ---the tray full of food. If the food was already gone from the plate and the child was still sitting there scraping, that scraping or spoon usage response is not going to be reinforced in the presence of that particular stimulus. In the presence of an S^D, the response will be reinforced, and in the presence of the S-delta, the response will not be reinforced. Remember that a stimulus can be an S^D in one instance and an S-delta in another. An example of a lack of discrimination between the two is one that often occurs in pre-language training. Beginning language training is usually based on imitation. Frequently children will cue in so intently to watching your mouth, they will imitate everything you want them to do in that setting. However, when you train receptive or productive language, your face doesn't offer cues any more. Thus what once was an S^D for their responding appropriately in one situation becomes an S-delta in another.

Let's spend some time now discussing stimulus shaping. There are things you can do or things you can manipulate in your own classroom, with your own materials so that you make it easy for the child to respond correctly. Unfortunately, I am sure some of you realize there are very few materials available in the field that are reasonably priced and yet are appropriate and durable enough for severely handicapped children. So in most instances, to employ stimulus shaping techniques, you will need to modify existing materials or make new materials. For example, if you are training use of puzzles for a leisure time kind of activity, you take one piece out, keeping the remaining pieces in and stabilizing them either with your hand or a piece of tape. Then set that puzzle piece right on the edge of the appropriate space. You then gradually move that puzzle piece farther and farther away so that finally it is one to two feet away and the child has to put it in by him or herself. You are not changing the child's response, the child still has to put it in the space. You are changing the stimuli that you present to the child. You are changing the material that you are giving the child, but you are making those changes very slowly, very discreetly, so hopefully the child will make a minimum of errors. Questions?

When you are training the child to respond to a two-choice discrimination task, where you have the child discriminating between one thing or another, you have to be aware of and concerned with the position of your stimuli. A child might choose the item in a certain position because s/he has been reinforced for this. The child may always choose the one on the right or always the one closest to him/her, etc. I'm not saying that you should alternate the positions of the stimuli perfectly. Do it in a random kind of sequence and if you have 10 to 15 trials at a given sitting in a 10 to 15 minute period with a child, you can mix them up well enough so that you can either catch a positioning response or you have given the child enough opportunity to break up that positioning response. For example, if

you were training a discrimination between a cup and a shoe, you would not want the cup always on one side and the shoe on the other side. You should alter it. You might have the cup on top and the shoe down at the bottom, one on one side, one on the other side, etc., so the child really has to make that choice or discrimination. S/he is not then responding to some abstract kind of positioning cue. Questions? Can you think of any other kinds of things that might be appropriate that we haven't mentioned? Examples?

Remember, you as an individual teacher can be an S^D for certain kinds of behaviors on the part of certain children. I don't know if any of you have noticed times when a child might tantrum for his/her parents and be tantruming like crazy when s/he comes to school, but when you are in the room, and because you have established stimulus control over that behavior, s/he doesn't tantrum. A child might be pretty good in the classroom, but for some reason, the bathroom sets him/her off. S/he tantrums in the bathroom but not in the classroom, so rooms can be an S^D for certain behaviors. As individual teachers, you might have beautiful control over a certain child's behavior. Remember the little girl in the wheelchair with the comb? One teacher had been working with her for so long that she would hold the comb up to her head and do a good share of that task. A new trainer, however, not yet having established that much stimulus control, could not get Becky to respond to the previous level of perfection.

When you are doing a task you need to not only attend to the child for appropriate responses but for appropriate attending behaviors. If the child starts tantruming or throwing the materials, you do not attend to that for a brief period of time. Then you go back and pick up the task again. You should use these techniques over and over again regardless of what teaching strategy you are using. *Do not* attend to inappropriate behaviors, but *do* attend to appropriate behaviors whether they be task oriented or not. Questions?

VIII. VERBAL AND MOTOR IMITATION TRAINING PROCEDURES

Time

Twenty minutes

Script

Before you begin an imitation training program or any program, you need to do a pretest. You need to measure the level at which your child is responding before you go to all the trouble of task analyzing a task in very finite steps. See what kinds of behaviors or what kinds of steps the child already has within that skill sequence that you don't need to program or train. Do pretest your children so that you don't waste your time and theirs, you and they could be going on to something much more functional.

Before you can do any imitation training, you have got to get that child's attention. You have to do something to insure that s/he is at least going to give you some eye contact or some approximation of looking at you while you demonstrate the task. Some of the things that have been used have little functional value as far as long term training for attention. For example, if this was a reinforcer *(Facilitator--hold up an objective)*, and I was trying to get *(participant volunteer's name)* eye contact or his/her attention to me, I might put that reinforcer between our noses so that hopefully, if that is a reinforcer for that child, s/he will be looking at the reinforcer and by doing so, will also look at me and thus get reinforced. We don't recommend that you stay on that kind of thing very long because it is not functional. What you are trying to do is begin to establish the fact that s/he is looking in your facial direction. When you do attention training, make it as functional as possible. If you are holding up an item and saying, "look at the ball," "look at the cup," "look at this look at that," so that the child is attending to certain items or certain activities that you are pointing out, you are still training attending. It is more functional and the children will come into contact with that kind of request more often than they will someone on their living unit or at home saying, "look at me." Do concentrate on getting the child's attention before you try to give him/her a model to copy for an imitation procedure. If you don't have his/her eye direction even approximating your body or the

movements that you make as far as getting his/her attention, you are not going to get the child to imitate a thing. Sometimes it helps to make your models very very gross. If you are doing a mouth movement where you are saying "ah," don't say, "Do this." *(*Facilitator--open your mouth slightly and say "ah" softly.)* Instead, really open your mouth and put some energy into it. If you are doing 'touch head,' make sure that you do a really sweeping upward motion with your arm.

A question that frequently comes up is how to sit with the child so s/he doesn't get up and walk away. I recommend sitting very close, putting his or her knees in between yours so s/he can't leave. Use your room; there are a lot of things in your room that you can adjust and manipulate to your best advantage. Maybe you have one child that continually gets up and runs out of the room or crawls under the table and is out of the room. Put him/her in the corner and sit like I described. With the child between you and the corner, there is no way that that child is going to leave. Of course, as soon as you can, you should try to establish verbal control or make your environment so reinforcing that s/he doesn't want to leave. Just as in attention training, make your verbal and motor imitation training functional. For example, show the child what you are talking about. Later on, you will want that child to receptively be able to identify an item or point it out, etc., so make it functional from the very beginning even though you are just in an imitation training situation.

If the child does not have any imitative skills, you will need to shape the response. If I was asking a child to imitate the verbal response, "cup" and s/he replied with "c," I would reinforce that in the beginning. I would shape that verbal imitation response, so the next time I might say "u," and ask him/her to do that response. I would be shaping "c" plus "cu" and hoping that by doing a few trials of that s/he will gradually say the whole word, "cup." Again, you have to work very gradually to change the response level or the response criteria, but shaping is very often used with verbal and motor imitation training. If you were training the motor imitation 'clap hands,' and the child put his/her hands together and if s/he has never done that before, I would reinforce it, "Good, that's great." If s/he had done that several times yesterday and I wasn't going to accept that level of responding anymore, I would prompt him/her by physically moving them closer together. First of all though, give the child a chance to imitate you without that help. Another thing that you need to be aware of is that if you reinforce the child with a goodie and act all excited every time he/she does anything, whether it is on the first prompt or the third, it is not going to be worth his/her while to put out that extra effort to do it on the first prompt without your help. So as a general rule of thumb, when you say "do this" or "say such and such" or whatever the instruction might be and the child completes the response on that first instruction, s/he gets the praise *and* the edible. If you have to correct the child or offer him/her some assistance, s/he doesn't receive the edible, only the praise. Decrease your level of the reinforcers for the child depending on how much assistance you have to give, so that you are not giving the child the highest amount of payoff for the least amount of response.

In summary, imitation training, whether it is motor or verbal, involves three basic components: 1) the teacher presentation of the model; 2) the student's response or correct copy of that model; and 3) the reinforcement for a correct response or approximation of that response. Questions?

IX. SEQUENCING INSTRUCTIONAL ACTIVITIES

Time

Ten minutes.

Instructions to the Facilitator

Present the following lecture adding examples from your own experience as you see fit. Ask for questions from the participants as you proceed. A lively discussion regarding the developmental approach may arise.

Script

This is a section in which I would like to throw out some ideas to you. I think after you work with your severely handicapped children for awhile, you will run into the same things we have run into

over the past year; you assess your students and they score very poorly. There is no lack of things for you to teach these children.

The problem with this population is not what to teach them, you can pick out in no time about 200 different behaviors they need to learn to function up to the TMR level. So we didn't really have any problem drawing up schedules, getting our classroom organized and starting programs. What started to become apparent over time, however, was the lack of relationship between the various target behaviors that we were teaching in our classroom. All the children were making progress and we were pretty turned on by that, but looking at the classroom as a whole, we would say "where is that going?", "where is that leading?", and "this doesn't appear to have any relationship to anything else that we are training." We were talking about this a couple of weeks ago with a group of people and we started talking about how there is a different way you could arrange your curriculum by looking at the various curricula that are available and draw from them something we have labeled as "clusters."

We are working on some behaviors where the children are not making any progress because of the lack of some basic responses necessary to perform the skills. It is so time consuming to "shape" all the response individually without a context in which it seems functional. We started to look at each child in terms of his/her basic response patterns. Then we develop a curriculum for that child around those patterns. I will give you an example of this. We have one particular child who has a grasp response (in fact, she even has a pincer grasp), but she doesn't have any kind of a response that involves a downward pulling motion. We have her in the handwashing program but she is not making any progress in the steps that have any kind of a pulling response either with her hands facing toward her or out. She has grasp and release, but she lacks some basic motor patterns. This is also affecting her performance in the T-shirt program where we are still working on the last step of pulling the shirt down from her armpits. She doesn't have the basic motor response of "pulling." If you attempt to get her to pull, her grasp releases. What we have started thinking about doing in all the areas we cover (self-help, motor, communication, socialization, pre-academic, and depending on the child's age, prevocational and vocational areas) is to cover at least one behavioral objective in each of those areas during the school day. We are trying to pick out target behaviors in those areas that incorporate the same basic response. There is a relationship between all the different target behaviors that you are working on. That way, rather than working on an isolated pull response in one program, you are working on it throughout the school day and you are more likely to establish that response and be able to go on to something new. Another example that we have been thinking about is head control. We have children that do not have any head control. The gross motor time of the day, may be the only time that we would have worked on head control in the past; other times of the day the children either sit in their modified wheelchairs with head wing support or their heads flop down to their chests. In order to incorporate that and make head control more functional, make it the primary "cluster" of responses that are worked on. This also benefits the child by putting him/her in a number of different positions. S/he is placed on his/her tummy on an incline mat (prone on elbows) and in that position we work on head control at the same time s/he is also working on visual tracking. For another portion of the day s/he is in his/her modified wheelchair and s/he really doesn't have much head control so some of the day it is allowed to be supported. Other times of the day and during the gross motor time now, instead of a more passive program where s/he is just put in a position that facilitates it, we actually actively try and program for it by placing him/her on his/her back; roll the shoulders forward and get him/her to start developing head control when being pulled up from the supine position. For another time of the day, to help him/her attend (because s/he not only is lacking a lot of muscle tone but s/he also has some uncontrolled random movements) an O.T. has developed a head harness for him/her that supports his/her head in the forward direction so his/her eyes are focused down on a piece of paper or on the wheelchair tray in front of him/her and then s/he can work. We try to determine ways that his/her head control can be facilitated and also work on other things at the same time rather than just choose one skill in an isolated area. If we program for that, a year passes and his/her head control hasn't improved considerably because it is so isolated. We are trying to develop a relationship between the curriculum areas and that is something you might keep in mind when you are developing programs for your students. Not that your children should not get exposed to other things during the day, but those are the crucial behaviors you really are concerned about right now.

Another thing that we want to talk about at this time (and this is really rare for a behaviorist to admit), but over the past few years it has become more and more clear, as the population that we work with goes down, that rather than sticking with a strictly remedial approach to education, you really have to go to the developmental approach. You have to give credit to following the developmental sequence in those behaviors that you program for your children. That, too, has to be tempered by a little bit of the behavioral approach by realizing that you do not program for every behavior in a developmental sequence. If we tried to program for every skill that the normal person goes through in his/her development, a severely handicapped student will be 80 years old and s/he still won't be able to walk. Some reason or logic has to be applied to a developmental sequence to pick out those behaviors that are most crucial, and those that aren't, you skip. The child's age should also be taken into consideration in choosing target behaviors. We are trying to come up with a process by which you decide (with your physically involved children) at what point you stop going for functional hand use for self-feeding and go to some kind of adaptive piece of equipment that will help the child self-feed. These kinds of decisions are going to have to be made by you in the next couple of years. Keep in mind the child's age, if s/he is 14 or 15 years old and s/he still hasn't developed a hand to mouth response (which is a prerequisite for self-feeding), at that point you might consider going to a piece of adaptive equipment which might involve a pulley that would enable that response to occur. Even training the use of a piece of adaptive equipment for this population takes a year or two to get truly independent use, so when you are deciding whether you are going to go for following the developmental sequence with some of your physically handicapped children, keep in mind their age levels and realize that even though ideally we'd like to go and follow it as closely as we could and build on what the children have, at some point functionality and the child's limits (and teacher's limits) must be realized.

X. SELECTING THE PROPER TRAINING TECHNIQUE AND WRITING A PROGRAM

Time

Twenty-five minutes.

Script

We need to discuss the selection of a proper or appropriate training technique. We have talked a good deal about different ways and methods to train the children, but not much yet on how you know what to use when; why do you choose shaping over backward chaining, or whatever. So let's discuss that for a few minutes and then you have in front of you a description of a child and we want you to write a program for that child.

Which teaching procedure you use with each child should be based individually on that child and the program that you are trying to use, it is not a blanket decision. You can't go in and say, "I like backward chaining, and I am going to use that with all my students for all my programs." That is ridiculous. You will run amuck very soon. So be flexible; be familiar with all the techniques and try them out. You might be surprised at which ones are easily used with which different kinds of programs. It is very important to consider the child's input area. Can the child hear, if so, how well? Can the child see; if so, how well? Does the child respond to tactile stimulation of any kind? Does s/he tolerate being put through tasks? You will not rely heavily on a demonstration teaching strategy or a demonstration for correction procedure if your child is visually impaired. Use your common sense. don't get hooked into just one teaching strategy for every program. Make this decision individually on the basis of each child's input capacity; input meaning how s/he gets information into him or herself, and how s/he processes that information.

Another thing that I talked about before is a baseline or a pretest measure of the child's skills. A pretest offers valuable information that can tell you a great deal about your child, about how much of the skill you need to teach, and also give you some hints as to what kind of a teaching strategy or teaching procedure to use. If the child can do a good share of the sequence or a good share of the task sequence, then it certainly is not necessary to shape that response from the very beginning. Use a

chaining procedure or a total cycle procedure with the child so that s/he doesn't lose what s/he has attained. However, if s/he has no skills or behaviors toward the terminal behavior that you are looking for, then you have to shape the response.

After you take your pretest data, you may have a preconceived notion or you may have a commercially published program that has a specified task analysis. After you get your pretest information, take a look at the sequence in which your child performs those particular responses. S/he may put the toothpaste on the toothbrush before s/he wets it whereas the program that you have chosen to adopt has him/her wetting the toothbrush first. Be flexible; allow the child to maintain his/her partial sequence of skills (even though it deviates from the program sequence) providing this does not interfere with future program steps.

From Special Education in North Dakota Regional Resource Center Project "Prescriptive Programming" by Debby Maxon and Bonnie Utley. Reprinted by permission of the North Dakota Department of Public Instruction and the Midwest Regional Resource Center.

XI. TRANSFER OF TRAINING

Script

I would now like to provide a number of practical suggestions which can influence transfer of training, and which will at the same time give the teacher direction for insuring durability of newly acquired skills in students.

Content should be selected with the consideration that it is quite likely to play a role in the student's life away from the classroom. Generalization across situations or across time can only occur if the desired behavior is reinforced across these dimensions. Therefore, once the child is removed from the original training setting and placed in his/her normal environment, those behaviors that were taught under training conditions must be the same ones that will be called upon in new settings. This reemphasis will eventually culminate in a further reinforcement, strengthening, and generalization of the originally taught behavior.

Classroom teachers must gradually reduce the amount of reinforcement once the student has demonstrated acquisition of the concept. Though it is unquestionably the case that a frequent reinforcement schedule produces effective and rapid strengthening of behavior there are certain inherent difficulties with continuing this type of reward program. In the natural environment it is difficult and unnatural to provide this regular reinforcement on a continual basis. It is apparent that the natural environment does not provide reinforcement as frequently as is normally encountered under training conditions. In many instances behavior is only reinforced after a certain number of responses have been emitted or a particular interval of time has elapsed. It should also be noted that while behavior is acquired and strengthened under frequent reinforcement, it is also more easily extinguished whenever the reinforcement is removed or greatly reduced.

Therefore, we do not advocate a frequent reinforcement schedule, the only exception being the initial acquisition of a behavior. Instead, we suggest that intermittent reinforcement accomplished through a gradual fading procedure holds the greatest potential for maintenance of behavior. The use of a fading system, coupled with intermittent reinforcement, provides a system both representative of the natural environment and resistant to extinction.

Students must practice newly acquired behaviors in a number of different settings and environments. For generalization to occur from the training situation to different environments it must be practiced and reinforced in those diverse environments. In addition, various groups of people, such as peers and parents, should be trained to deliver appropriate reinforcement across a variety of settings.

Teachers and school resource personnel must be prepared to provide transition time when changing the stimulus conditions. As stated earlier, generalization must be programmed and not expected. Since programming involves a gradual succession of therapeutic steps, time is an essential component in any management process. When the stimulus conditions of a behavior have been altered, there are bound to be some initial increases in inappropriate behavior or decreases in appropriate

behavior. Change agents must be prepared for these events and must continue the program until the behavior again comes under control in the new setting. While changes in the rate of behavior are not an inevitable occurrence when altering stimulus conditions, the frequency with which they arise should alert the teacher to anticipate, and be prepared to deal with, the situation.

Classroom teachers must help the exceptional child establish his/her own reinforcer hierarchy. In order for reinforcers to either increase or decrease the occurrence of a behavior, they must have some value to the individual obtaining them. If a child has the opportunity to select what his/her own reinforcers will be, the teacher can dispense with the usual trial and error method of finding the effective contingencies of reinforcement.

In decelerating undesirable behavior, the teacher must be consistent across environments. If there is one rule that should be judiciously applied, not only for generalization measures but for all behavior management techniques, it is *consistency*. Several inadvertent reinforcements of undesirable behavior in new environments will merely extend the reinforcement schedule and make the inappropriate behavior more resistant to further eradication efforts. It is imperative that the child come to understand that his/her behavior, or lack of it, will be treated similarly in diverse environments.

Teachers must weigh the potential of peer control and the influence which peers can have on the durability of a behavior pattern. The possibility of peer influence as a means of facilitating response maintenance has been discussed earlier. Peer programming is an important tactic to employ in the classroom, since other students have both the time, the opportunity, and an extraordinary amount of reinforcement value. However, while peer control is feasible, there are certain concerns that each teacher must weigh in determining if this technique can be useful in the classroom. Specifically, the verbal level of the class may not be conducive to peer programming; many students' parents may not be favorable to their child being used as a change agent to help another student; and the consistency and follow through of peers in the program may not be adequate. If an affirmative response to each of these conditions cannot be made, peer programming may not be the best means of achieving maintenance and generalization.

When employing token economy programs for classroom control or for developing new behaviors, the teacher should plan to fade the token reinforcement and help students develop self-administered reinforcement systems. The student should have increasing amounts of input in selecting reinforcers, establishing criteria, and determining the availability of earning reinforcement for him or herself. With a dynamic changing economy, the reinforcer system does not lose its potency and student interest remains keen. In this manner, tokens as well as their backup reinforcers will retain their reinforcing properties in different settings.

Instructions given by teachers or peers should be explicit and at least initially followed by immediate behavioral consequences. Teachers or peer direction must be clear and concise. In the event that several teachers or a teacher and peers are giving instructions to a child, coordination among those giving direction must be arranged so that consistency is maintained and confusion avoided. Even for the individual teacher, it is important to give instructions that are clear, can be understood by the child, and are consistent across settings and time.

It is of equal importance when attempting to get a behavior to generalize to follow that behavior by immediate consequation. Behavior and reinforcement must be paired so that a functional relationship begins to accrue between these components.

Taken from "Transfer of Training in Behavior Modification Programs: An Evaluative Review" by Paul Wehman, Marty Abramson and Charles Norman. The Journal of Special Education, 1977, 11, (2), 226-228. Reprinted by permission.

One of the more critical areas in special education is the issue of program evaluation and accountability. In recent years, there has been an increased emphasis on developing quantifiable performance objectives which can be objectively assessed and evaluated. Teachers of exceptional children are expected to meet program objectives and verify completion of objectives through systematic evaluation procedures (Jones, 1973). Unfortunately, a technology for systematic evaluation has not found its way into many classrooms for children with learning and behavior problems.

As increased tax dollars are required for handicapped students, the potential for a legal backlash from parents of nonhandicapped children grows. There is little doubt that if special educators cannot justify the larger proportion of dollars allocated to exceptional children, that parents of nonhandicapped children will speak out. This is especially true because of two considerations:

1) Many nonhandicapped students, particularly in urban areas, are without up-to-date textbooks and equipment, and go to school in overcrowded classes. This can usually be attributed to lack of funds.
2) The gains which handicapped children make through special education have frequently not been documented regularly in an objective and nonambiguous fashion. Objectives are not clearly specified and thus it is difficult to evaluate the impact of special education services. Many exceptional children are severely handicapped and tend to make gains very slowly.

Unless a system is devised that is sensitive enough to assess the advances made by severely handicapped children and evaluate the effectiveness of training programs, special educators will be unable to defend charges that public school services are not justified for these children.

Considerations in Evaluating a Child's Progress

Frequency of Evaluation

A decision which must be made, usually by the teacher, is exactly how often short term instructional objectives will be evaluated. Objectives may be evaluated at the end of each lesson, weekly, bi-weekly, or once a month. As a general rule, the child's progress on an enabling skill should be monitored frequently enough so that the teacher:

1) receives feedback as to the progress of the child; the more frequently the child's skill level is evaluated, the easier it will be to assess problem areas;
2) can make necessary modifications in methods or materials and ascertain whether the instructional sequence is effective or not;
3) can verify that the child has attained the objective; once the child has learned the skill then the next skill in the instructional sequence can be taught with the newly acquired skill being reviewed periodically.

It is advisable, however, to implement continuous evaluation measures i.e. evaluate progress each session, with children who do not display clear cut gains in their programs. Marks on a chart or a graph will provide a gradual ascending trend of progress, if the program is working, thereby giving indications of the child's mastery of the skill as well as the rate of learning. For those who work with severely impaired children, this type of evaluative feedback is an important aspect of determining the child's progress.

Reliability of Evaluation

The reliability with which data are collected will be indicative of how accurate the information is. Accuracy of monitoring the student's progress can be influenced by a number of factors. If the child or teacher are ill, if the same person always does the evaluating or if there is confusion or inconsistency about the method of evaluation, the data collected will be suspect. Therefore, it will be erroneous to make any important decisions about the program effectiveness with the child.

One means of increasing the reliability of observations is to have a second person collect data independent of the teacher. For example, in order to achieve a reliability of agreement that the target behavior is actually occurring at a given rate, two or more independent observers must simultaneously view the response. In this way, an index of the consistency of agreement may be established. Reliable

recording of behavior is the foundation of a good evaluation. Inconsistent agreement between observers casts serious doubt on the credibility of evaluation data.

Reliability may be determined two ways depending on the assessment method employed. With a frequency measure of responding, the smaller frequency is divided by the larger frequency and multiplied by 100. That is, if observer A notes a child acting on 20 different toys, and observer B counts only 18, then the reliability index would be 90% ($\frac{18}{20}$ X 100 = 90%). The same procedure is used in duration recording with the smaller measure being divided by the larger measure, and then multiplied by 100. An illustration of this might involve the length of a child's tantrums. The teacher may view the tantrum as lasting 10 minutes but the teachers' aides would see it lasting 12 minutes. This would constitute 83% reliability ($\frac{10}{12}$ X 100 = 83%).

A slightly different formula is used in finding reliability of agreement with interval recording. Reliability is calculated in the following way:

$$\frac{\text{Total Agreements}}{\text{Total Agreements + Total Disagreements}} \quad \text{X } 100$$

Only intervals or cells in which behavior occurred are counted in the total agreements plus total disagreements.

Validity of Evaluation

The validity of the evaluation technique addresses the question: does the instrument which is used to assess the child's progress measure what it purports to?

One way to ensure validity of evaluation measures is to employ different types of techniques. For example, if a teacher of mildly retarded children is interested in improvement of the classes' reading comprehension skills, then an observational assessment of percentage of correct answers might be computed and recorded daily. This would be an example of *criterion-referenced* evaluation. As a second evaluation of reading comprehension, however, a standardized test such as the Durrell could be employed. This test is *norm-referenced* meaning that performance levels are computed on the basis of how a large number of other children have performed on the same test.

By utilizing two types of evaluation, classes' performances could be cross checked. Although improvement on one measure (observational assessment), might not be mirrored by similar advances in the norm-referenced standardized tests, the use of two different measures allows for independent means of tracking a child's progress.

Individual Performance Evaluation

The balance of this lecture is directed toward describing different program designs which may be employed by teachers to evaluate the child's progress. The designs which are outlined below range from simple to more sophisticated and several can be employed to specifically assess the effectiveness of instructional procedures. The program evaluation designs discussed in this section are commonly used in behavioral programs. The interested reader can obtain a far more detailed explanation from Hersen and Barlow's (1977) text, Single Case Experimental Designs.

Prerequisites to the Use of Individual Program Designs

For individual program designs to be valid, several prerequisites must be met Performance objectives need to be stated in behavioral terms (Mager, 1962) with a minimum of confusion as to the behavior being recorded. Ideally, two independent observers should be able to agree on the occurrence of a target behavior with a consistently high degree of accuracy.

Once an enabling skill has been identified for instruction, data collection procedures must be decided upon. Regardless of what type of data are collected (e.g., frequency, duration), a target behavior should be assessed regularly. In this way, close attention to and monitoring of program progress is enhanced, both through daily perusal of data as well as precision-teaching techniques. Often in the classroom, teachers find little time available for frequent data collection. When this is the case, a

probe format is suggested where behavior(s) can be monitored periodically, such as once a week, and the teacher may still receive objective feedback as to the effectiveness of teaching procedures results, etc.

Specific Program Designs

A number of instructional program designs are available for the evaluation of child progress (e.g., Kazdin, 1975). However, it is the purpose of this section to present a review of only the most basic and relevant program evaluation formats which may be of value to special education teachers. It is emphasized that these evaluation designs can be employed with one, two, three, or as many children as the teacher wishes to evaluate.

Pretest-Teach-Posttest

The most common program design employed by teachers interested in quickly evaluating student performance is the pretest-teach-posttest design. In this design, the teacher identifies a skill for training and then assesses the pre-instructional level of the skill. This is assuming the behavior is in the child's present repertoire of skills. If it is not, then the teacher would indicate that it is occurring at a zero level, and begin teaching procedures. As the child acquires the skill, posttest measures of progress are taken to verify the meeting of performance objectives.

For example, assume that a young child placed in an EMR class cannot print or write. Assume further that the teacher wants the child to copy the entire alphabet as an initial step in writing program. Thus, data must be taken for a pretest measure of how many letters, if any, the student can copy legibly. Teaching procedures shall include a stimulus fading technique where initially there are very small spaces between broken lines or dots which when connected make the letter. Gradually the spaces may be lengthened to a point where the student is virtually copying the letter with no assistance. Evaluation consists of a periodic posttest check every 10 days or so to assess the number of letters which are being acquired with this teaching procedure and how many days is required for a letter to be learned.

The advantage of this design is that it is quick, economical, and easy to administer. However, this design can only be recommended when the teacher is absolutely certain of the validity of teaching procedures being employed, when evaluating the effectiveness of the teaching procedures is of little concern, or when there is little time available for data collection. The primary disadvantage of the pretest-teach-posttest is that without a control group (randomly selected or matched subjects who do not receive treatment), no definitive statements can be made about the experimental effectiveness of the teaching procedures being utilized. Change in behavior may occur as a result of outside the classroom variables such as alterations in student medication, greater attention at home, increased peer acceptance, etc. Therefore, the teacher may erroneously feel that certain instructional procedures may be used successfully with other students.

A goal which all classroom teachers of handicapped children should point to is the development of teaching practices and procedures which are replicable with other students, and which may be successfully implemented by inexperienced teachers. The value of teaching procedures which can only be performed by one teacher is limited.

This design should be used when a teacher has a large class of children and therefore has little time for continuous evaluation of lessons yet desires an objective means of probing the child's acquisition of the skill. It is a good way for beginning teachers to get into a routine of systematic evaluation.

Multiple Baseline

Another design which may be considered for use is the multiple baseline design. A multiple baseline design is an excellent means of evaluating instructional methodology while also measuring the child's progress. With this instructional design, program variables may be evaluated across students across settings or environments, or across behaviors. When using a multiple baseline design across students, baseline (pre-teaching) data would be taken on a target behavior for two or more students. For example, when baseline data for students were consistent and stable with minimal fluctuation, a certain teaching procedure would be introduced with Robert. Data would continue to be collected for

all students in the multiple baseline, but instruction would only be given to Robert. When significant changes in Robert's behavior are noted, then the instructional procedures would next be introduced to Michael with data still being collected on all other students in the design.

The same format can also be carried out across behaviors. For example, a teacher might wish to evaluate how effective a token reinforcement procedure was in the acquisition of reading skills writing ability, and computational behaviors with five students. Once enabling skills were identified for each of the three domains then data would be taken on the level of each student's pretoken reinforcement performance. After a stable baseline was established, token reinforcement would then be delivered for the goal of 90% reading comprehension, while writing and arithmetic behavior would continue to be assessed but with no instruction. As reading comprehension increased with delivery of token reinforcement, then the same treatment could be used with writing, and eventually arithmetic skills as well.

If noncompliance behavior or refusal to follow instructions seems to be a problem, and no one can influence the student, then a multiple baseline design across time might be an appropriate format for evaluating management procedures. Once again an index of noncompliance behavior would be assessed during several times (e.g., percent of commands complied with) such as early AM, midday AM and noon. The initial treatment procedure might be a 5-minute time-out from positive reinforcement contingent on each noncompliance episode. The treatment could be initiated during the first time period. If the plan is successful then, the time-out contingency could be extended into the second and finally third period.

Reversal Design

An alternative evaluation format available to the more experimentally oriented teacher is the reversal design. In this design, baseline data are gathered on a target behavior which the teacher may want to increase or decrease. A treatment procedure is then implemented and evaluated; if the procedure successfully alters the target behavior, the teacher then removes the procedure briefly in a return to baseline phase. During this period the behavior should revert to the original baseline response level if the contingency was directly instrumental in affecting behavior change. Once the behavior returns to baseline level, the instructional intervention may be re-instituted and response maintenance procedures developed. With subsequent reversals (e.g., replications), support is given to the efficacy of procedure or contingency being employed.

The problems of reversal designs in applied settings, particularly a classroom should be readily apparent. Teachers laboring to develop academic skills in students are not enthralled with the possibility of losing the newly developed behaviors, regardless of replicability and efficacy issues. Furthermore, many academic skills do not lend themselves to reversal. Reading and speech skills once acquired, come under control of naturalistic reinforcement contingencies such as the intrinsic joy of talking or reading certain types of materials. Finally, the ethical issue of reversing behavior is one which should be taken into consideration before employing the reversal design.

Changing Criterion Design

Perhaps the most viable alternative to the previously discussed evaluative methods is the changing criterion design (Hartman & Hall, 1976). With a changing criterion design, the teacher establishes an initial criterion to be obtained by the student, and then gradually through behavior shaping procedures increases the criterion of trials to success to a higher level. Alternatively, if an error to criterion format is being employed, then the criterion level would be steadily decreased. The changing criterion design lends itself nicely to self-recording and self-evaluation by the student who may participate in the charting and graphing of his or her progress. It also is an especially effective design for evaluating programs which employ behavior shaping techniques.

Hartmann & Hall (1976) have written an excellent paper reviewing the merits of the changing criterion design and in doing so have outlined several points which must be considered in employing the design correctly. These include the following:

1. All treatment (instructional) phases should be long enough to ensure that successive changes in a therapeutic direction are not naturally occurring due to either historical maturational or measurement factors.

2. Treatment (instructional) phases should differ in length, or if of a constant length should be preceded by a baseline phase longer than each of the separate treatment phases.
3. Each treatment phase must be long enough to allow the rate of the target behavior to *restabilize* at a new and changed rate; it is stability after change has been achieved, and before introduction of the next change in criterion, that is crucial to providing or convincing demonstration of control (pp. 531-537).

The use of instructional design will come about only through the systematic education of teachers. In the past decade, many teachers have adopted such instructional practices as instructional objectives, task analysis, operant conditioning technology, and data-based programming via tools such as precision teaching. Utilization of these techniques has increased the sophistication of educational services to children with learning and behavior problems. While these strategies have influenced content and method of instruction, they have not been effectively integrated into classroom program evaluation. In order to maximize the quality of instruction, teachers need to adopt one more strategy - program design. Program design enables the teacher to efficiently determine the efficacy of an instructional technique and thus maximize the probability of scholastic success for the learner. Through the application of criterion-referenced measures and individual performance evaluation the teacher may match instructional needs with teaching techniques and achieve the best possible instructional fit.

Integrating Individual Performance Designs into the Classroom

The first step in the use of program design is having a working knowledge of the advantages and disadvantages of each type of design which have already been discussed. The second step, given the selection of an appropriate design, is to develop skill in coordinating instructional objectives so that those children who are in the baseline data collection phase awaiting instruction on one objective are receiving instruction on another objective thus making maximum use of instructional time. For example, use of the multiple baseline design, by its nature, requires the teacher to use data in making programming decisions. The third step in applying design to program evaluation is using data once they are collected. Since the teacher using multiple baseline techniques is already committed to determining the efficacy of a teaching technique, data will necessarily be reviewed and program changes made on the basis of pupil performance. The scheduling of data reviews will become an automatic part of the classroom responsibilities of the teacher. In addition, the review of data may become a reinforcer for the teacher as it supports the competency of the teacher in arranging special learning conditions.

Eugene Edgar

INTRODUCTION

The IEP Mandate

The IEP, mandated under Public Law 94-142, is the first time that federal legislation has intervened into the classroom, legislating an educational planning process for teachers. While the controversy remains unresolved over the rights of the federal government to intervene into this formerly sacrosanct professional domain, we will use the old adage that, the law is law and accept the IEP's as a given.

The IEP's are described in the rules and regulations, Federal Register 41, No. 252, December 30, 1976 in S121A 220-S121A 226. The only interpretation that can be made with regard to this congressional mandate is that the IEP is a teacher, administrator and school system accountability check to translate the federal goal of an "appropriate education for every handicapped child" into reality. The IEP is not a binding contract between the teacher and the child in the sense that one or the other is culpable if the goals of the IEP are not achieved. Rather, it is a discrete planning process designed to systematize the educational planning process into an individualized, child-oriented approach and, to that degree, is a binding contract that the specified services will be delivered. IEP's, under the law, must be written for each child by September of 1977. They must be rewritten and reviewed annually, and each Local Education Agency (LEA) has a one year grace period, until September of 1978, to provide the child with all the services enumerated in his/her IEP. The complications surrounding its implementation, development and evaluation will exist for years. However, most special educators will welcome the IEP as a standard process for meeting the unique needs of children.

The Rationale

The educational philosophy of special education has recently come under attack. We, in the profession, have not settled upon a clear statement of purpose as to our desired goals for all handicapped children. Cliches such as "develop to full potential," mainstream into regular education," and "independent living skills" are often bantered about when professionals discuss the outcome of special education for severely/profoundly handicapped children, but seldom are they discussed with any meaningful eye toward definition and implementation. Obviously these terms are too general and cannot be measured.

Most educators will agree that there are five major steps which must be included in the educational process for handicapped children. First, there is an assessment/diagnostic process in which it is determined what the child can and cannot do. From this information a determination is made as to what the child should learn next. Activities are then planned so as to facilitate learning. The plan is then implemented and at some point, child performance is measured in order to evaluate the effectiveness of the entire plan. This process--assessment, goal-setting, planning for instruction, implementation and evaluation--is common to almost all educational strategies for handicapped students. Any good educational program will have these components.

The Individual Educational Plan (IEP) is simply a composite statement of the total plan. Dynamically, the IEP is the midpoint between the gathering of assessment data (the determination of the child's present level of functioning) and the implementation of the educational intervention. By itself, the IEP is meaningless and serves no useful purpose. Viewed as the in-depth planning phase after assessment data has been collected and before intervention begins, the IEP becomes the cornerstone of appropriate educational programming for handicapped children.

From The Experimental Education Training Program-An Inservice Program for Personnel Serving the Severely Handicapped. Norris G. Haring, editor. *Copyright 1977, University of Washington. Reprinted by permission.*

Areas of Concern

In reality, almost everything required for the IEP is currently being done by competent teachers. The only major changes are that a committee will be responsible for developing this plan and that all the information is to be recorded in one place. The latter issue, that of recording data in one place does not seem to be a major concern for anyone. However, the idea of a committee functioning for each child has caused considerable concern among professionals in the field. Two points need to be clarified; first, the makeup of the committee. The law clearly states that the minimum membership is to be: (1) the child's referring or present teacher, (2) a representative of the local school district and (3) the parent(s). Additional members, including the child if over 18, may be included (Federal Register, Vol. 41, No. 252, December 30, 1976, p. 56986). However, Section 121a432, (p. 56991) states that the committee contain individuals "knowledgeable about the child, the assessment results, . . ." That is, the committee must contain individuals who are competent in interpreting assessment data.

A recurring discussion about IEP's centers on the issues of time and responsibilities. There is some concern that this entire process will demand so much teacher time that there will be a decrease of instructional time. Other complaints have focused on the problems all committees have in reaching agreement and that the committee, in fact, is invading the domain of the teacher. Both of these issues need to be resolved if IEP's are to be practical and effective.

To our way of thinking both these issues can be resolved if two practices are followed. First, members of the committee certainly can work individually before the formal meeting in order to collect information and generate possible ideas for the IEP. Second, the professionals (teachers and LEA personnel) need to truly believe that the parents have a basic right to be involved in their child's education. Undoubtedly there will be instances when parents (or teachers or psychologists, etc.) will impede the process. However, we believe that these will be the exceptions rather than the rule. The committee is, in fact, the most appropriate group to determine a child's instructional plan. The education of severely/profoundly handicapped individuals is an extremely complex task. Not only is little known about this population but the expertise of a variety of professionals is needed if the most appropriate education is to be provided. Therefore, true teamwork is essential in developing and implementing programs for these individuals. Even if considerable time is spent in developing the IEP, the results will more than justify this time.

Another major concern about the use of a committee to develop the IEP relates to the scheduling and number of committee meetings. The law allows flexibility to the extent that individuals can be assigned various tasks and the committee need only meet to agree on the final plan. Certainly each individual case must be handled to best facilitate adequate program planning for the child. The intent of the law is clear——a group of responsible, competent individuals will develop each child's IEP. The method by which this is accomplished is left to the discretion of the group.

Components of the IEP

General Considerations

In this section we will enumerate the components of the IEP and present some ideas of what they mean for SPH children. The following sections of "Procedures" will deal in depth with examples of how to write and/or process each of the thirteen components. Each IEP must contain the following components:

1. A summary of present levels of the child's performance.
2. Yearly goals.
3. Recommendations for specific special educational services, including physical education and special media and materials.
4. A statement concerning planned activities with non-handicapped children.
5. Short term objectives for each yearly goal.
6. Evaluation criteria and procedures for each objective and goal.
7. A list of specific educational or support services needed to meet each objective.
8. A list of the persons responsible for implementation of each objective.
9. The beginning and end date for each of the listed services.

10. A stated date for re-evaluation of the IEP.
11. Placement recommendation and justification.
12. Signatures of the committee members (and the parents if they are not on the committee) indicating approval of the plan.
13. Dates of all committee meetings.

Summary of Present Level of Performance

The only way in which accurate statements can be made about current levels of performance is to have functional contemporary assessment information. In fact, the entire IEP is completely dependent on accurate assessment information and the appropriate analysis of this data. At a minimum the current levels of performance for severely/profoundly handicapped children must include data on: gross motor skills, communication skills, social skills, self-help skills, cognitive (pre-academic) skills, specific health concerns (medication, seizures, allergies, illness, etc.), physical involvement (positioning), stimulus control, and proven reinforcers. Meaningful educational programming is dependent on these data.

Yearly Goals

The yearly goals for SPH children need to be related to the statement of present level of performance. A primary question must be asked at this point: "What do we want the child to be able to do?" In reality, this question should have also been addressed during the assessment phase. Basically, this idea has to do with the careful consideration of attainable goals and the subsequent programming to reach these goals. Each specific instructional objective and each instructional activity must relate to some future functional behavior. When dealing with this population, no time, not even a moment, can be wasted on nonfunctional activities. The careful selection of meaningful pertinent yearly goals is the major safeguard preventing inappropriate instruction.

Recommendations for Specific Special Educational Services

This component provides the committee with the opportunity to list all special services that are needed to meet the child's specific needs. Certainly occupational and physical therapy and communication skill building are two critical areas for SPH individuals which will probably be noted in every IEP. Any special materials (especially, adaptive equipment) or media (braille or hearing devices) should also be noted. This law is very precise in stating that a specific physical education program should also be included here. According to the definition of physical education in 94-142 (p. 56978) physical and occupational therapy may be considered commensurate with physical education.

Planned Activities with the "Non-Handicapped"

This requirement simply asks for the committee to put in writing the most optimal situation for integrating the handicapped child with the non-handicapped. In some cases this might not be possible or appropriate. Each committee, however, should ask the question: "Can this child profit from interactions with the non-handicapped?" If the answer is affirmative, provisions for such interaction should be specified.

Short Term Objectives

Specific short term objectives need to be developed which will lead to the accomplishment of each yearly goal. These objectives should be stated in terms of observable child behavior with specific criteria for success. The specificity and number of these objectives will depend on the frequency of the meetings held by the committee, which must meet annually at a minimum.

Evaluation Criteria and Procedures for Each Objective

The precise method and criteria for evaluating each objective must be specified. Good behavioral objectives, by definition, include this information. Each objective should include exactly what the child will do, to what observable criteria, under specific circumstances. The persons responsible for collecting this evaluation data should be the individuals who are responsible for implementing the program (teachers, therapists). However, the entire committee needs to review this data at their re-evaluation conferences.

Specific Educational and Support Services for Each Objective

For each objective there must be a corresponding list of the services required to meet these objectives. Although detailed teaching plans are not included at this point, these statements should include such things as special programs, materials or types of special services (OT, language training, etc.).

List of Persons Responsible for Implementing Each Objective

Each objective must include the name of the individual who has the major responsibility for implementing that objective.

Beginning and End Dates of Services

The beginning and ending date for each special service and for each short term objective must be recorded in the IEP.

Re-evaluation Date

Each IEP must include the specific date at which the committee will meet to re-evaluate the IEP. This must be done at least once annually.

Placement and Justification

The committee must make a specific recommendation for placement and provide a justification for this placement over other possible placements.

Committee Signatures

Each IEP must include the signatures of the committee members and the parents stating that the IEP has their approval.

Meeting Dates

The dates for all committee meetings should appear on the IEP.

Procedures: How to Develop an IEP

There are four major procedures that need to be carried out in order to develop an appropriate IEP: (1) the collection of relevant assessment information on the child; (2) deciding on the main priorities for educational intervention (establishing yearly goals); (3) determining how to achieve these goals; and (4) justifying the IEP. The responsibility for these activities is that of the committee. However, the committee does not necessarily have to perform each function nor meet as a group in each phase, but they must agree on each component of the final plan.

Obtaining Assessment Information

As stated previously, the IEP cannot be viewed as an isolated event but rather as part of the total ongoing process of education. Before any instruction can begin, a determination must be made of how the child presently functions. This is typically called initial assessment.

When dealing with this population there are several general areas of assessment information that need to be collected; general health and medical information, physical involvement, considerations for instruction, and specific areas of instructional content.

Medical Assessment.

There can be no substitute for a thorough medical examination. Even though there might be very little that can be done to correct these medical or health problems they very often influence instructional planning. Therefore, not only must these problems be noted but an interpretation must be made as to how they affect the child's instructional programming. Such matters as seizures, medication, heart defects, allergies, susceptibility to illness, strength and stamina, and special feeding instructions are types of assessment information that must be considered in the formation of the IEP.

For example, it is extremely important to be aware of any major medical problem which may affect the child's performance in the classroom. Heart defects may require a curtailment of certain types of physical activity or the need for specific rest periods. The possibility of surgical techniques to alleviate physical problems (club foot, cleft palate, leaking heart valve, etc.) must be explored and considered. In the rare cases of degenerative central nervous system diseases, the IEP must focus on the best strategies for maintaining current functioning and retarding the loss of current skills. However, the most common medical information of importance to teachers usually deals with medication. Not only must the types of medications being used be noted, as well as possible side effects but procedures for conducting controlled studies of varied dosages should also be established. The classroom situation allows for the collection of relevant information on the most appropriate level of medication, especially for seizure control medications.

The basic purpose of this medical information is to enable the development of a comprehensive IEP. Thus, this information must be used to provide for ongoing medical treatment (medications, diet control, seizure control) as well as to determine considerations for educational programming. Specific physical limitations may alter educational priorities (a paralyzed arm, for example, might dictate that instruction will be geared to the good arm and that physical therapy will be given to the immobile arm). Allergies may limit the types of food that can be used as possible reinforcers. The need for rest will certainly be a factor in determining the daily schedule of activities (a child with a serious heart problem might need to have complete rest three or four times a day). All of this information needs to be gathered and summarized in the IEP.

Physical Assessment.

The great majority of severely/profoundly handicapped children are also physically involved. When this is the case, a prime area of assessment needs to focus on this problem in order to determine specific educational goals and to also specify certain procedures as they will affect all areas of the educational program. Positioning, for example, is of prime importance for severely/profoundly handicapped individuals, not only as it may relate to a therapeutic program but also as to how various positions may facilitate or hamper other educational programming. Techniques to relax children who are spastic and strengthen those who are athetoid, procedures for lifting and moving the children, and the possible use of prosthetic devices are all critical pieces of information that must be collected during the assessment phase.

For any child who is experiencing physical problems, the initial assessment information should attend to three major points. First, a competent occupational therapist or physical therapist needs to determine the specific therapeutic needs of the student. These needs, of course, will be built into the IEP as needed special services. Second, the information gained from this evaluation should point out any specific physical limitations of the child that will affect educational programming. For instance, if a PT, OT, or physician determines that a child's legs will never bear weight, walking will probably not be an educational goal. Third, especially for the severely involved child, specific positioning and handling techniques need to be specified. Some children are better able to use their arms and hands if they sit or lie, or depending in what position they are lying. Thus, the OT or PT should be able to determine how to position the child so that the child will be physically best able to make the desired responses. This position should be noted on the IEP as the desired educational position.

In the great majority of instances, OT's or PT's will be used as consultants to the teacher in the classroom. The initial assessment information, therefore, should include specific information on how the teacher and therapist will interact throughout the school year. Information should be included on the types of behaviors that might occur which would demand immediate therapeutic attention. For example, a student with recurring contractions might need a specific therapeutic consultation if the frequency of the contractions increased rapidly over a period of time.

As with the medical assessment information, this physical assessment data needs to be recorded on the IEP both for special program considerations and also to see how it interacts with all educational programming.

Educational Assessment.

The essence of this assessment phase must focus on educational assessment for instructional

programming. Although this is a complex issue, several pertinent areas need to be discussed at this point. First, the process of assessment involves teachers looking directly and frequently at specific child behaviors. Second, the materials the teachers use contain procedures for measuring objective behaviors which are sequenced developmentally in various content areas, but always including gross motor, fine motor (or cognitive), communication (language), social and self-help behaviors. Third, the formats in which the materials are presented should be program-specific; that is, they are derived from the specific goals of the educational program.

Because assessment data are used primarily by teachers, they need to be directly involved in designing the procedures for assessment and collection of the assessment data. Since teachers are the primary consumers of educational assessment data and because they are the professionals most involved in educational programming they should be deeply involved in the assessment process itself. The assessment data most beneficial to teachers are those related to actual child behaviors and collected over a period of time.

Direct observation of child behavior provides data which can be interpreted many different ways, but the data should reflect actual occurrences of behavior. By observing children in what is a large part of their natural environment, the teacher collects information concerning child performance on a variety of tasks, under conditions in which the child is typically expected to perform.

The actual assessment materials, although they vary according to specific teachers, should be objective; that is, they should assess specific, observable behaviors. By using already established lists of sequenced behaviors that relate to functional terminal skills, the teacher can pinpoint those skills a child can perform in given skill sequence and determine which skills need to be taught next.

Since the teacher will be the primary data collector, the techniques employed must be usable by teachers in typical classrooms. Although this requirement precludes using many currently available commercial instruments, it is crucial that the teacher be able to collect assessment data in the classroom easily and with minimal interruption of typical classroom procedures.

Although there are a wide range of skill content areas that teachers will assess in their students, there appear to be five major categories of behavior that must always be assessed. Gross motor skills (general mobility or ambulation) are prerequisite skills for independent living and general interaction with the environment. Unless the student is absolutely fluent in negotiating his/her environment, gross motor skills must be a primary content area for instruction. Fine motor skills (cognitive, or preacademic, or academic, or prevocational) cover the skills of eye-hand manipulation as well as the basic academic areas. Obviously these are critical skills, not only in and of themselves but also as building blocks for more advanced survival skills. All human beings need to be able to communicate with other individuals. Both expressive and receptive language skills are priority skills for our students. Self-help skills, especially self-feeding, -grooming, -dressing, and -toileting serve as basic requisites for independent living. Social skills, the ability to interact appropriately with others and including leisure time activities, may be the most critical skills in determining a happy life for these students. In any case, the content areas of instruction need to be assessed by the teacher.

Educational programming should emerge naturally from the collected data. This means that the format should be such that data analysis or re-computation are not necessary before program decisions can be made. If the data collected are not easily interpreted and usable for programming, there is little reason to collect it. The format should provide a step-by-step movement for the teacher and a system which is easy for incoming staff to learn and to use.

Stimulus Control

Before any meaningful program can be developed, stimulus control must be established. Basically, this means that, at the very least, one behavior is under control by the teacher. The response may vary from "look at me," to a touch response or a simple gross motor imitation. Stimulus control is critical for all future educational programming. Before any new response can be trained the teacher has to have control over at least one behavior. This behavior is then used to establish the learning set, e.g., "Kristin, look at me——good, now put the spoon on the spoon . . .." In this case, "Kristin, look at me" is the cue that instruction is about to take place. In fact, this becomes a discriminative stimulus, in that when the requested response is performed reinforcement will follow. In some cases stimulus control might be established around a response that will be used to teach new concepts, for example,

touching an object. In this case, an object is placed before the child and the command, "Anne, touch the block" is given. The desired response, touching the block, is physically shaped and reinforced until the child responds without physical prompting. This response, touching, can then be used to teach other concepts such as matching or selecting. If stimulus control is not present this becomes a crucial immediate instructional objective. The goal is to simply get one behavior under control. The only time this concept may not be applicable is when working with profoundly handicapped children who have no operant behaviors. In these cases, basic motor manipulation and stimulus input activities are called for until such a behavior can be developed.

Reinforcers

Establishing a proven reinforcer must occur, usually simultaneously, with stimulus control. This task, however, is often very difficult with this population. It is very important to remember that a reinforcer is some event that can be dispensed by the teacher which increases the behavior it follows. Especially with this population we are often too quick to say, "he likes to be touched" or "she smiles when I tickle her" or "socials work well." All such cliches are meaningless unless they do in fact increase the behavior they follow. A recent doctoral dissertation at the University of Washington confirmed what most of us have believed for years; that there is no universal reinforcer for the severely/profoundly handicapped. Under very controlled conditions food (orange juice), social praise (verbal and touch) and movement (rocking) were used with 20 profoundly handicapped children. Each child received each of the three types of reinforcers--with greatly varying effects. The bottom line appears to be this--each child must be treated as an individual and reinforcers must be individually determined. One suggestion is that a reinforcement team should be developed in each center with the prime purpose of determining reinforcers. Various foods, light boxes, vibrators, and other techniques could be tried with each child until a sound, reliable reinforcer has been determined.

There are undoubtedly many other professionals who can provide important assessment information (the CDS, social worker, nurse, psychologist, etc.) but at the very minimum an OT or PT, a physician and the classroom teacher must be involved in obtaining the basic initial assessment information needed to develop the IEP. The format of this information should be threefold: a clear statement of the child's present level of functioning, a precise list of the next crucial skills to be learned, and specific ideas about programming for these skills.

Determining Priorities

Probably the most important activity of the committee is to analyze the assessment data and establish priority areas of instruction. This particular activity determines the appropriateness or inappropriateness of the IEP. The most technically correct IEP, if focused on inappropriate instructional goals, will result in low quality instruction. The determination of these priorities has been left up to the committee. In fact, there can be no legal mandate in this area as each child needs to be treated individually. By acknowledging this, the committee accepts the responsibility for carefully setting meaningful instructional priorities for each child.

The basic decision-making points in determining content priorities are: (1) current functioning level of the child; (2) any specific physical limitations; (3) age of the child; and (4) functional behavioral goals. For any given child any of the first three areas may take priority; however, the concept of a functional goal must always be the major priority for planning.

Current Functioning Level

Before any meaningful program can be developed an accurate statement of the current functioning level of the child in each content area must be made. This is interpreted as the highest level of the skills the student has in each level. For example, the content area of communication can be easily divided into two major subcomponents--expressive and receptive language. In each of these two subcomponents there is a fairly agreed-upon sequence of skills. The assessment information in this area should reflect exactly where in the sequence the child is performing. Hence, the priority area for instruction should be at the next level. When programming is planned at the lower level, valuable instructional time will be lost. If programming occurs at too high a level there will be little, if any, success as well as a high degree of frustration on the part of both student and teacher. A caution

should be noted at this point: Regardless of the appropriateness of the initial assessment data, mistakes will be made. With the careful use of ongoing assessment procedures, teachers are able to quickly detect any pinpoints that are too high or too low for a given child. In essence, daily instructional data should probably take precedence over initial assessment data in determining level of instruction, but if the daily data indicates a lower level of functioning than did the initial assessment, a careful explanation of the initial assessment data is called for. In this case the teacher will have to consult with the individuals who collected the initial assessment information and try to determine the cause of the discrepancy.

Physical Limitations

There are very obvious physical limitations that will necessitate alterations in priorities. For example, students who have no use of their fingers (and there is little or no hope for an increase in these functions) should not be programmed for pincer grasp activities. In this case alternative skills need to be taught. Or, completely deaf children should not be expected to acquire basic auditory skills. These obvious cases of physical limitatons will certainly alter the instructional priorities. However, specific functions (e.g., motor manipulation, receptive language) still must remain as instructional priorities; only the specific skill descriptions will change. A very special caution is needed here: many times these obvious physical limitations are poorly documented. Many cerebral palsy children and partially sighted children have been poorly programmed because teachers assumed they could never use their fingers or see. Any case of physical limitations must be precisely documented before priorities are changed.

Age of the Student

The age of the student plays a specific role in determining priorities. Clearly, programming for infants will focus on basic developmental milestones (basic reflexes, etc.). An older individual——16- or 17-years-old——requires somewhat different programming, if for no other reason than there is a much shorter period of available instructional time left. There are, however, some basic skills that are critical, regardless of the age of the child. These basic skills are: basic expressive and receptive communication (respond to name, indicate yes/no), basic self-help skills (self-feeding, -toileting, -dressing, -grooming), and mobility (movement through the environment). In reality, these are fairly high level skills for many profoundly handicapped individuals and expectations need to be based on common sense. Especially with severely handicapped adolescents, we must look very carefully at the types of skills we are trying to teach. A rule of thumb should be, "Are pinpoints teaching to immediate functional behaviors for the individual?" As the age of the student increases, this question becomes more pressing.

Functionality of Skills

The ultimate criteria for programming must be: "Will this skill provide the individual with a functional behavior that will directly enhance his/her ability to live independently?" This priority should direct all goal setting activities. Unfortunately many educational objectives are established simply because these objectives are "always used." In essence our educational programming is often superstitious behavior. There is a long list of critical behaviors for all future development (head control, pincer grasp, discrimination skills, etc.), but there is also a list of behaviors which may or may not be functional for later development (bead stringing, puzzles, etc.) which are often given as critical educational objectives. Each skill that is taught should either be a functional behavior in and of itself or should be a building-block skill (a skill which is part of a functional behavior).

There are obvious instances when alterations need to be made, as in the case of physical limitations, when extra enrichment activities such as swimming can be included and when a specific task can be used to teach a certain skill, e.g., bead stringing to teach pincer grasp. However, each goal and objective must be determined in light of its relevancy to functional behavior.

Determining How to Meet the Goals

Upon the determination of the yearly goals the committee must devise procedures that will

facilitate their accomplishment. This task includes the setting of some short term objectives for each yearly goal; the determination of any needed special services, their duration, and who will perform these services; a means for evaluating each yearly goal; the establishment of a meaningful physical education program; and plans for integrating the handicapped child with non-handicapped peers. Finally, the committee must agree upon a specific placement for the child and a brief justification for it, establish timelines for all future committee meetings, and sign the IEP.

Establishing Short Term Objectives

For each yearly goal the committee needs to determine several short term objectives which will lead to the final desired behavior. Although the number of short term objectives will undoubtedly vary from committee to committee and child to child, a general rule of thumb should be at least four objectives for each formal evaluation period. Hence, if the IEP is to be evaluated twice a year there should be eight short term objectives per yearly goal.

These objectives should be written in terms of student performance. Thus each objective should include a behavioral statement as to what the student will do, under specific conditions, and to what criteria. For example, "On teacher command, Anne will touch a hair brush (no distractors) on four of five commands, for two consecutive days."

These short term objectives are to aid the teacher in developing a functional instructional sequence for each yearly goal. However, the teacher must have the flexibility to alter the sequence based on daily classroom data. Most importantly, however, the objectives should lead to the accomplishment of the yearly goal.

Listing Special Needs

After short term objectives have been established for each yearly goal the committee must list all special services that might be required to achieve these objectives. For example, if the yearly goal is to develop the pincer grasp (thumb and forefinger) the committee might decide that the short term objectives are:

1. Rebecca will hold a rocker stacker ring in her hand for at least one minute;
2. Rebecca will rake an object to her when the object is placed within 18 inches of her, four of five times;
3. Rebecca will pick up three one inch cubes, using a palmar grasp, in one minute;
4. Rebecca will pick up six one inch cubes, using a pincer grasp, in one minute.

For these objectives the committee may decide that an occuaptional therapist should evaluate Rebecca's progress on a weekly basis and prescribe exercises for Rebecca's hands based on this evaluation. In this instance, the special service of occupational therapy needs to be noted, along with the name of the therapist, when these services will begin and end, and how these services will be evaluated (in this case the evaluation will correspond to the child's objective).

The committee must note each type of special service which may be required in order to achieve the yearly goals (medical services, therapy, speech and language, prosthetic, etc.), who will perform these services, for what period of time (begin and end date) and how each service will be evaluated.

Physical Education Plan

The committee must recommend an appropriate physical education plan for each student. In most cases of programs for severely/profoundly handicapped students, traditional physical or occupational therapy stands in lieu of this requirement. However, especially for adolescent students, specific training in games and other types of physical leisure time activities certainly are desirable goals. The yearly goals of the child will greatly determine the type of physical education plan that is most appropriate for each student.

Statement on Integration

The committee needs to prepare a joint statement specifying all instances when the student will interact with non-handicapped peers. Obviously, this statement will depend on the skill levels of the child and the opportunities that are available in any given school district. Activities such as lunch, recess, and other planned activities should be included here. However, the committee should be very careful to only list those activities in which planned, meaningful interaction will take place.

Placement Justification

Upon the completion of the entire IEP the committee must prepare a brief statement of justification for the placement. This statement simply needs to indicate the placement, why it is deemed most appropriate for the child, and that the entire committee agrees with this placement.

Time Frame

The time frame under which IEP's must be generated are fairly clear-cut in terms of severely/profoundly handicapped students. Obviously these students will be identified early in their school life and hence the IEP for each student needs to be completed within 30 days of the beginning of the school year. At a minimum, the IEP needs to be evaluated and reformulated annually. In many cases the IEP will probably require more frequent evaluation.

Certainly committees that have good working relationships will be in frequent communication and informal evaluations will occur periodically throughout the school year. The last duty of the committee is to sign the IEP document, indicating approval by each member.

Instructional Plans

An IEP, by itself, is insufficient. Just as assessment information must be formulated into an IEP, the information from the IEP must be developed into individual instructional plans for each child. Although the format of these instructional plans will vary across districts, the basic components of these plans are stable.

An instructional sequence must be developed for the skill that is to be taught. From this instructional sequence, the immediate child performance objective is determined. Procedures are then derived which will facilitate the desired child response (materials, teacher activities). Specific consequences are selected for each type of possible child response--correct, incorrect, no response. Finally, a procedure for measuring the effects of the instructional program is devised.

Instructional Sequence

An instructional sequence must be developed for each objective stated in the IEP. The instructional sequence is developed by one of two basic techniques; task analysis or use of developmental sequences.

Task analysis.

Task analysis may be used to determine an instructional sequence. Using this procedure, a competent individual is observed doing the task and observers note the sequence of the various steps performed to complete the task. For example, for buttoning, the sequence might be: pinch button hole, put button in button hole, push button through button hole, pinch cloth near button hole, pull button and cloth, release fingers. Almost any motor task can thus be broken down into very small sequential steps which lead from the beginning to the end of the desired skill.

Developmental sequences.

For some behaviors, which develop differently than they are performed, developmental sequences need to be used. For example, rolling over is topographically different when sequenced though the task analysis of a competent "roller-over" as compared to how infants learn to roll over. Competent adults roll over in many different ways, e.g., by leading with the hips and then having the knee and arms follow. Infants, however, almost always begin to learn to roll over by leading with their eyes, then head, arms, shoulders, hips, and legs. Thus, for some skills, we need to consult with developmental guidelines in order to determine the most appropriate instructional sequence. However, regardless of the technique used to formulate the instructional objectives, these objectives must be organized into an efficient instructional sequence, which may be different than the original sequence.

There are three basic techniques which can be used to resequence specific skills into instructional sequences: forward chaining sequences, backward chaining sequences, and middle chaining sequences. The first two, forward and backward chaining sequences, are very common. In forward chaining, the first skill is taught first, the second skill second, and so on until the terminal skill is achieved. In backward chaining, the last skill of the sequence is taught first, the second to last skill second, and so on until the student can perform the entire skill independently. Chaining from the middle of the

sequence out to beginning and end is less common but often very effective. For example, a developed sequence for self-feeding with a spoon could be: grasp spoon, scoop, bring to mouth, put in mouth, remove food from spoon, remove spoon from mouth, chew and swallow food, return spoon to plate, and repeat cycle. The instructional sequence might be altered by taping the spoon to the child's hand and beginning the instructional sequence with, put spoon in mouth, and working both backward and forward in the sequence.

Although instructional sequences are determined by task analysis or development sequences the teachers must take the time to explore the best possible sequence for teaching. There are no fixed rules as to which type of sequence works best; only by carefully trying different procedures can a teacher determine which works best with any given child.

Child Performance Objective

After the instructional sequence has been developed, the immediate instructional objective must be written in clear behavioral terms. Care and consideration at this point will facilitate instruction and the collection of ongoing assessment data. Basically an instructional objective should state the child's desired behavior in observable and measurable terms and should include a specific criterion for success.

Teaching Procedures

Upon the completion of the immediate instructional objective the teacher's next task is to review the IEP in order to determine if any special considerations need to be noted in developing the instructional procedures to be used with the child. The teacher must select the materials and procedures that will be used to teach the objective. Obviously both the materials and procedures will vary greatly depending on the specific characteristics of each child. The materials need to be related to the objective being taught, special learning characteristics of the child, and of course, safety considerations. Procedures such as modeling, cueing, or prompting need to be selected depending on the child and the objective. Careful considerations at this time will greatly determine the success of the plan.

Consequences

The next task for the teacher is to determine consequences for all possible child responses to the instructional procedures. Basically there are only four possible child responses: correct incorrect, no response, or acting-out. Hopefully a specific program will be developed for any acting-out behavior that can be used throughout the day. The teacher must decide how to reinforce the child for correct responses, how to respond to error responses, and what to do if the child makes no response. The IEP should provide some clues as to possible reinforcers. Response to error will depend on the child and the instructional objective but certainly might include correct model, physical shaping, or prompting. No response consequences might include repeat of instructions, prompts, or reinforcing sampling (physical prompting and giving the reinforcer). In any regard, the teacher must plan for all these possible contingencies.

Evaluation

The final planning task for the teacher is to develop an effective and easy to manage data system to provide for ongoing assessment. The system must supply information to answer the question, "Is the instructional plan working?" Although these procedures may vary greatly, they must include an actual measure of correct child performance in relationship to the number of opportunities and/or time. Ideally, data will be collected daily on each child's program. Probes, partial samples, or even samples taken two or three times a week might be required due to circumstances in any given classroom. Somehow, the teacher must make data decisions about the child's program, either to change the program, or continue with it, or to celebrate success and move on to a new objective. With this system developed, the teacher is ready to implement the instructional plan and make good instructional decisions throughout the school day.

Conclusion

The IEP component, along with the provision of full educational opportunities for all is probably the most revolutionary aspect of P.L. 94-142. In fact, the IEP is the cornerstone by which appropriate education is defined for each child. As a result, it is not surprising that the concept of IEP's has caused the most concern among professionals in the field.

Although, in reality, the separate components of the IEP have always been included in any good educational plan for handicapped children, any time educational practices are mandated by law, professionals tend to view the new requirement as a hardship. The committee requirement in the development of IEP's has also added to the anxiety of the field. Rather than viewing the IEP as another hoop to jump through we encourage you to accept this opportunity to improve the quality of education for handicapped children. As with any new convention, one can find many problems with the IEP concept; but on the other hand, one can also find that the IEP will provide many solutions to problems associated with the education of severely/profoundly handicapped students. If we adopt the solution viewpoint, IEP's will become one of the most useful educational practices in special education.

Instructor Materials: Transparencies

Transparency No. 1

SYSTEMATIC INSTRUCTION

Step	Reasons	Implementation
Assess	1. to provide information about child's present level of skill development (performance level) in order to ensure that instructional programs are built on acquired skills 2. to provide information to parents, educational personnel and relevant individuals for consideration in educational planning	1. use of child reports - progress reports - medical reports 2. interviews of previous teachers, parents, and other professionals 3. formal testing - diagnostic tests - achievement tests - developmental tests 4. informal testing - teacher-made tests - specific skill tests - sequence related tests 5. teacher observation
Establish Long Term Objectives	1. to provide guidelines for the focus of instruction 2. to provide information to parents, administrators, teachers, and interested individuals as to the direction of educational programs 3. to provide a basis for yearly evaluation of instructional procedures and programs 4. to meet state requirements where necessary	1. write objectives which: - reflect important areas of focus - are written in measurable, behavioral terms - specify: - the learner - the behavior - the conditions - the criteria for success
Establish Short Term Objectives	1. to provide a "plan of action" for attainment of the long-term objectives 2. to provide the basis for specific instructional programs	1. establish sequence from commercial materials and/or 2. sequence developmental skill areas and/or 3. sequence from least complex to most complex skills and

Step	Reasons	Implementation
	3. to provide a basis for the evaluation of instructional procedures and programs	4. write each short term objective in measurable, behavioral terms specifying · the learner · the behavior · the conditions · the criteria for success
Develop and Write an Instructional Plan	1. to describe individual teaching programs based on current performance levels 2. to specify programs which will ensure that long and short term objectives are met	1. select and specify materials which are appropriate to the sequence step or specific short term objective · commercial material · teacher-made material · selected teaching procedures 2. select and specify instructional procedures which are appropriate to: · the instructional materials · the learner 3. select and specify reinforcement procedures
Develop and Write Measurement Procedures	1. to describe measurement procedures by which the teacher or other educational personnel can determine whether a child is successfully moving toward the accomplishment of educational objectives	1. select and specify a measurement system which · reflects the behavior specified in long and short term objectives · accurately reflects pupil performance · displays information in a manner which communicates pupil progress
Implement the Instructional Plan and Measurement Procedures	1. to facilitate learning 2. to determine whether a pupil is successfully moving toward the accomplishment of educational objectives 3. to provide objective information to parents, administrative personnel, etc., as to the child's actual performance.	1. present instructional programs 2. implement measurement procedures

Step	Reason	Implementation
Modify the Plan Based on Data	1. to ensure a pupil meets educational objectives 2. to prevent failure	1. antecedent events (materials as well as methods) 2. consequent events or consequences - feedback on performance - reinforcement contingencies
Evaluate Overall Progress	1. to ensure continued evaluation of overall pupil performance 2. to provide summative information for parents and future teachers on the performance levels of pupils	1. establish programs which measure pupil performance through review or maintenance checks 2. periodically re-assess pupil performance

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PRE & POST TESTING Current Functioning Level

* Select assessment guide
* Choose assessment areas & items to be tested
* Determine pass-performance criterion
* Collect & position relevant task materials
* Minimize distractors
* Establish student's attending behavior
* Issue item-specific task request
  * Use "natural" speaking voice
  * Avoid any/all prompts
* Do not consequate student's response
* Record student's response as correct/incorrect
  * Note task item for possible prerequisites
  * Reposition task materials if necessary
  * Repeat task request to criterion

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Purposes of Assessment

1. To find appropriate skill level of person

   Too high - child may fail

   Too low - child may become bored

2. To base future results on fair and objective frame of reference

Baseline (Initial Assessment):
Observation and recording of individual's behavior before instruction;

(Pretest)

On going Assessment:
Observation and recording of individual's behavior during or after instruction;

(Post-test)

Assessment Process:

1. Start with informal observation;

   1. Parent interviews
   2. Home/class observation
   3. Past records

2. Use screening devices & behavior checklists;

   1. LAP
   2. TARC
   3. Vineland
   4. Preschool Attainment
   5. Partage Record

3. Identify and prioritize skills in

   1. Self help
   2. Language
   3. Leisure
   4. Work

Write objectives

4. Do task analysis assessment to find entry level skills -pinpont

Baseline ——→ Instruction

Guidelines in Assessing Child's Functioning Level

To get a true picture of child's skills:

1. **Be consistent in amount and frequency of cueing that you give.**

2. **During initial assessment (before beginning instruction), do not give the child feedback as to being right or wrong — NO REINFORCEMENT!**

3. **Assess for several days before concluding the child is at a given skill level.**

4. **Don't waste time on assessing skills that are obviously too high or too low. Use informal observation to (guess) estimate.**

Things to Look For in Informal Assessment in Home or Class

1. Social Area

    1. Amount of interaction in family
    2. Toward whom interaction is directed
    3. Initiating and sustaining interaction
    4. Amount of interaction directed toward child
    5. Qualitative aspects of toy play

2. Self-Help

    1. Toileting accidents at home
    2. Amount of help parents give child
    3. Individual's eating proficiency (amount of spillage, preferred foods)

3. Behavior Control

    1. Frequency of parent or teacher reinforcement for compliance
    2. Type of punishment used
    3. Frequency and consistency of punishment
    4. Effectiveness of reinforcers vs. punishers when utilized by different parents

Types of Observational Assessment:

1. **Task Analysis (Pinpointing) Assessment**

   Definition:

   Finding exact point where child consistently is unable to perform target behavior in sequence;

2. **Frequency Assessment**

   Definition:

   Running tally of given target behavior(s);

3. **Duration Assessment**

   Definition:

   Amount of time given behavior lasts;

4. **Rate Assessment**

   Definition:

   Running tally of given target behavior in a specified period of time.

Sample Data Sheet for Hair Combing

Task Analytic Assessment Before Instruction
Cue: "John, comb your hair

Steps in Days

Task Analysis	M	T	W	Th	F
1. face mirror	+	+	+	+	+
2. look into mirror	+	+	+	+	+
3. pick up comb	+	+	+	+	+
4. move comb from left to right on top of head twice	+	-	+	-	+
5. left to right in front twice	-	-	-	-	-
6. use comb to make part on hair	-	-	-	-	-
7. comb part twice	-	-	-	-	-
8. move comb twice down back on hair	-	-	-	-	-
9. put comb away	-	-	-	-	-

WHICH OF THE FOLLOWING EXAMPLES INCLUDE THE ELEMENTS OF A WELL DEFINED BEHAVIOR?

1. JOHN WILL STAY IN HIS SEAT DURING TASK TIME.

2. AMY WILL DECREASE HER CRYING BEHAVIOR.

3. SHELLY WILL INCREASE HER INDEPENDENT FEEDING SKILLS.

4. KIM WILL INDEPENDENTLY HOLD HER SPOON AND SCOOP FOUR SPOONFULS OF FOOD DURING EACH MEAL.

5. ANDY WILL ENJOY LOOKING AT A BOOK.

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FEEDBACK ON BEHAVIOR EXAMPLES

1. "IN HIS SEAT" DOES NOT MEAN THE SAME FOR ALL OBSERVERS. IT COULD MEAN STANDING ON HIS CHAIR, "IN SEAT" MUST BE COUNTABLE.

2. "CRYING BEHAVIOR" IS NOT COUNTABLE UNLESS IT IS MORE CLEARLY DEFINED. IT MAY NOT ALWAYS BE OBSERVABLE.

3. "INDEPENDENT FEEDING SKILLS" CANNOT BE COUNTED.

4. THIS EXAMPLE INCLUDES OBSERVABLE, REPEATABLE, AND COUNTABLE BEHAVIOR.

5. "ENJOY LOOKING AT A BOOK" IS NOT OBSERVABLE, MAY NOT BE REPEATABLE, AND IS NOT COUNTABLE.

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Frequency Assessment:

A simple tally or count of behaviors which are occurring

Example:

Betty gets out of her seat 13 times a day

9 - 10:00	IIII
10 - 11:00	II
11 - 12:00	𝍸
12 - 1:00	I
1 - 2:00	I
	Total - 13

$$\text{Rate} = \frac{\text{Total Amount}}{\text{Total Time Worked}}$$

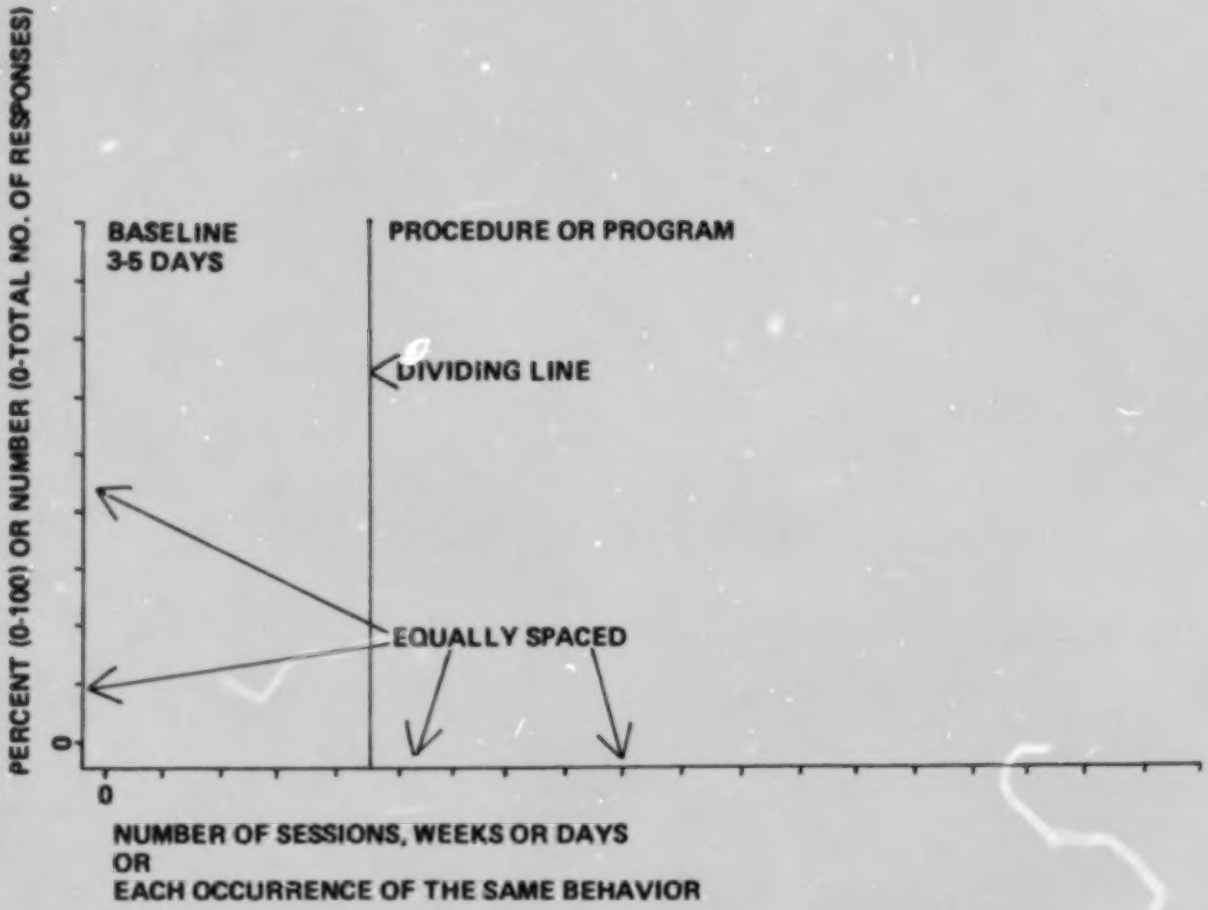
Example: John worked 30 minutes. He completed accurately 10 pulleys. His rate of work is:

$$\frac{10}{30} = .33/\text{per min.}$$

Why Use Rate?

- Good standard means of measurement
- Can be used when length of work periods vary

Transparency No. 15



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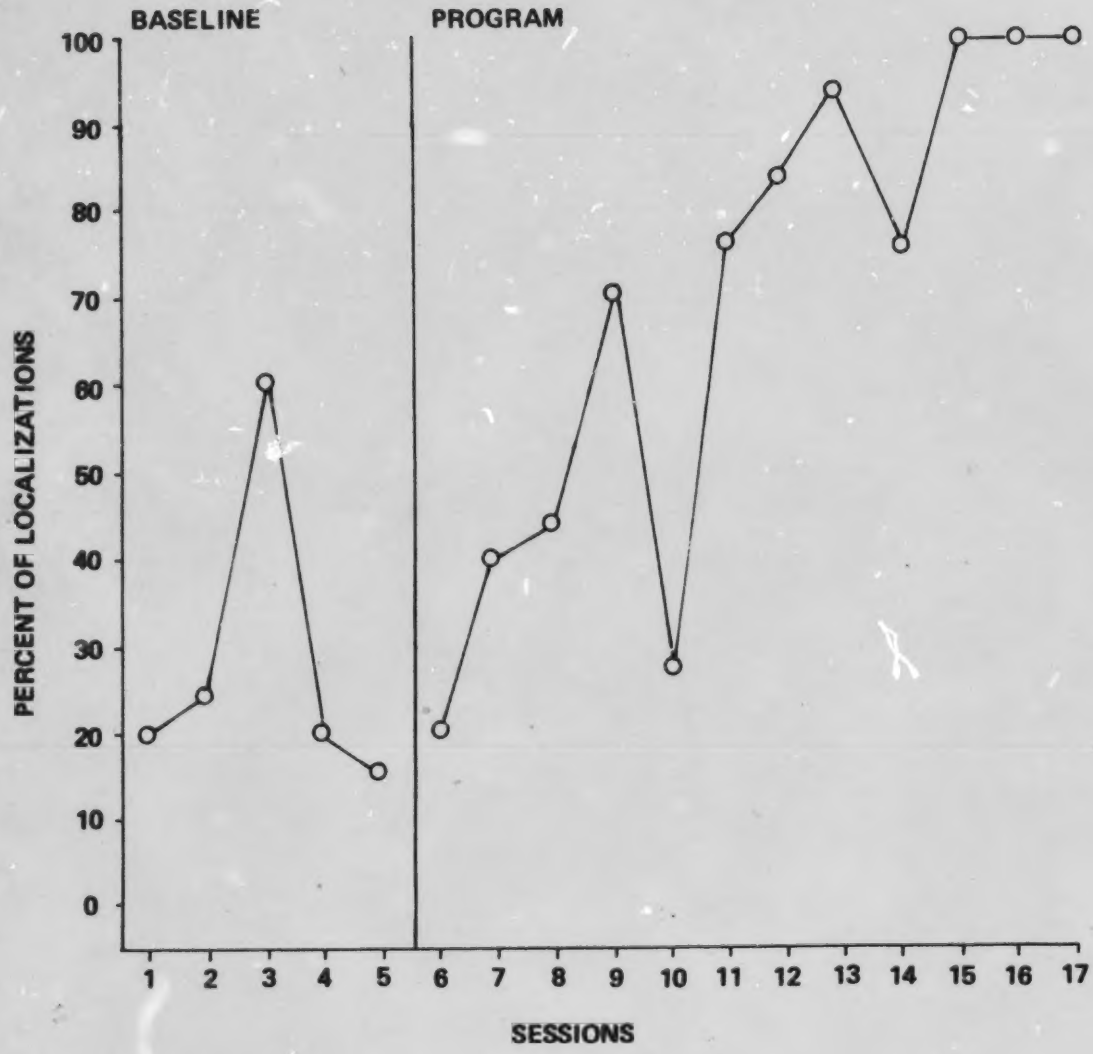

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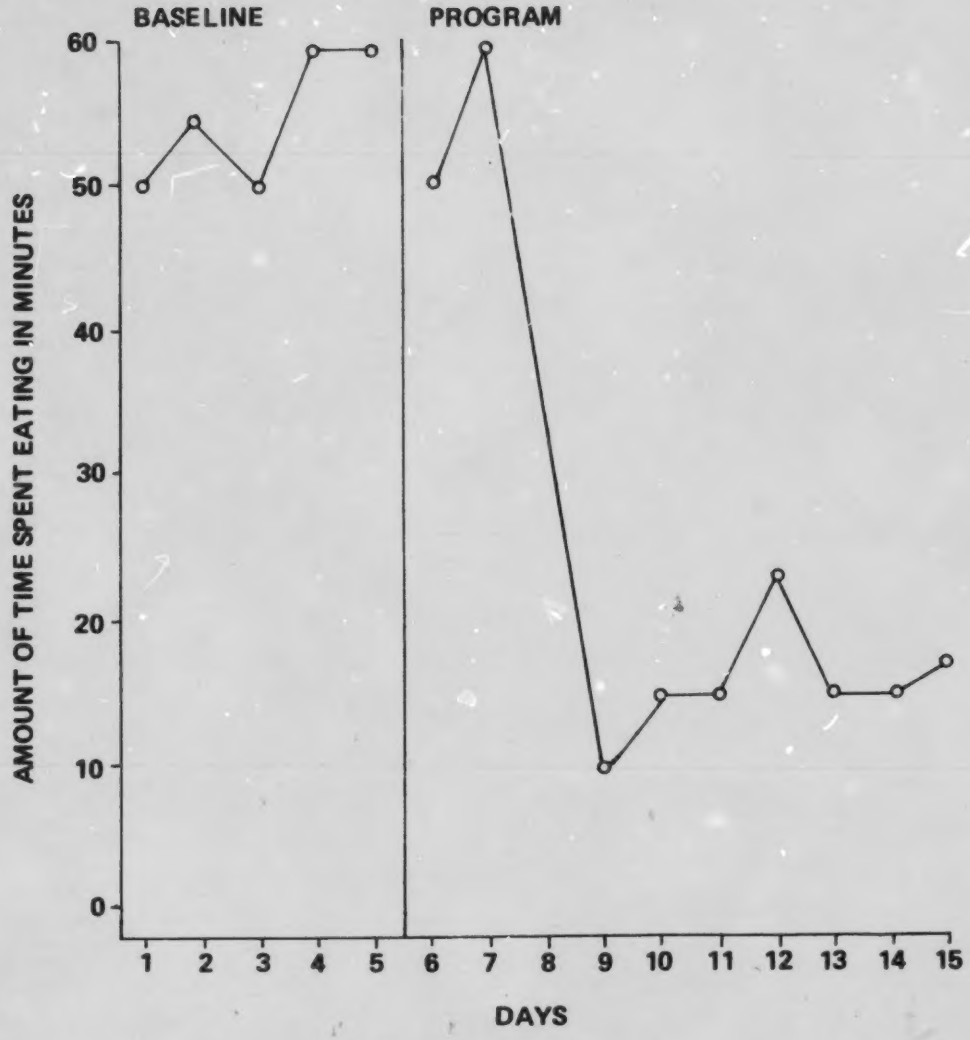

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Identifying Annual Goals

1. **Criteria to Use in Selection of Annual Goals:**
   1. **Why should the skill be taught?**
   2. **Is the skill necessary to prepare students to ultimately function in complex heterogeneous community settings?**
   3. **Could students function as adults if they did not acquire the skill?**
   4. **Are there other important skills which might be trained more quickly and efficiently?**
2. **Criteria to Use in Writing Instructional Objectives:**
   1. **Conditions -- Specify performance conditions**
   2. **Observable Behavior -- Specify action type skill which can be observed**
   3. **Criteria -- Specify criteria for terminal behavior**

All behavioral objectives should include the following three components:

1. **Behavior - A description of expected terminal behavior goal which can be observed by at least two independent observers.**

2. **Conditions - A statement of the conditions under which the behavior is to occur.**

3. **Example - Given a baseball and glove, the student will throw the ball into the air and catch it seven times out of ten.**

   The ball should be thrown at least five feet into the air.

Conditions	Behavior	Criteria
Given a baseball and glove	The student will throw the ball into the air and catch it.	When thrown in the air at least five feet, the ball will be caught seven times out of ten.

Illustrations and Examples

	Good Selection	Poor Selection
1. Teaching shape discrimination to profoundly retarded children with minimal self help and language skills	____	____
2. Teaching phonics-based reading to severely retarded adults	____	____
3. Teaching low level fine motor skills to profoundly retarded children	____	____
4. Teaching a nonverbal profoundly retarded adult to talk	____	____
5. Teaching social play skills to an "autistic" child	____	____
6. Given an array of three objects, one cup and two non-cups and the directive "Show me the cup," JoAnn will find (touch, point to, pick up) the cup, with 90% accuracy	____	____
7. Sheila will exhibit 50% more proficiency in her social-emotional development	____	____
8. Given a job interview, Pat will shake hands with the interviewer with no errors	____	____

Good Example - While in the classroom the student will not hit, bite, scratch, kick, throw objects, or engage in any other act which results in harm to another student. A consecutive 30-day period of no harmful behaviors will indicate satisfactory performance.

Bad Example - The student will become better adjusted to his/her environment and act more appropriately.

Good Example - Given the command, "Button your shirt, Jimmy," and a shirt with 8 buttons, the student will button all the buttons on his shirt 90% of the time.

Bad Example - The student will gain greater independence and confidence in his self-care skills.

Issues in Developing Good Behavioral Objectives:

1. What criteria level of performance is acceptable?
2. Why must a behavior be specified so clearly?
3. How do objectives relate to program development?

Transparency No. 22

Behavioral Objectives Activity Sheet

Goal: Increase self-help skills **Area: Self-help**

Long Range Objective: The pupil will indicate the need to use the toilet 90% of the time outside of regularly scheduled trips to the bathroom.

Short Range Objectives

Who	Behavior	Conditions	Criteria
Objective 1: The pupil	**will raise his/her hand when s/he needs to go to the bathroom to use the toilet**	**in the classroom**	**80% of the time (trial is for 1 week)**
Objective 2: The pupil	**will go to the bathroom and use the toilet**	**given the verbal cue "go to the bathroom**	**80% of the time without assistance**

Task Analysis

Definition: Breaking down a behavior into smaller steps that can be taught individually to child;

Why should a special education teacher use task analysis?

1. Good for pinpointing assessment and finding child's exact skill level;
2. Good for teaching — children learn best in small steps!
3. Good for teacher in following a specific order and sequence;
4. Good for individualizing instruction for children at different skill levels;
5. Good for homogeneous grouping in instructional situations;
6. Good for evaluating and assessing progress;
7. Good for replicability — different adults in classroom can implement program

Points to Consider
Task Analysis & Skill Sequence

Small target skills make up 1 task analysis

Several related & sequenced task analyses lead to a skill sequence

Task analysis sequences represent the CHILD'S behavior — not teacher's behavior.

Teacher's behavior is reflected in teaching procedures.

Task analysis represents the curriculum — the "what" of the lesson. Teaching procedures are necessary to implement the task analysis.

Finding Task Analysis or Curriculum Sequences

1. Commercial resources and textbooks
2. Curriculum guides and labs
3. Adapt child development norms
4. Make up task analysis sequence yourself

   Steps involved:

   a. Identify behavior objective

   b. List component skills in task

   c. Arrange component skills in logical order

   d. Establish prerequisite skills

Use your imagination and self-practice before actually using sequence

TASK ANALYSIS FOR COMBING HAIR

Identifying Component Steps in the Task

1) Child locates comb.
2) Child picks up comb in one hand.
20) Child places comb back in its proper place.
19) Child brings teeth of comb completely through rear portion of hair.
3) Child raises comb to center of the head.
18) Child combs rear portion of hair by bringing teeth of comb to three-fourths of the way through hair from top rear to bottom rear of hair.
6) Child combs hair in the center of the head forward by bringing teeth of comb three-fourths of the way through hair from center of head towards front of head.
5) Child combs hair in the center of the head forward by bringing teeth of comb one-half of the way through hair from center of head towards front of head.
17) Child combs rear portion of hair by bringing teeth of comb to one-half of the way through hair from top rear to bottom rear of head.
4) Child combs hair in the center of the head forward by bringing teeth of comb one-fourth of the way through hair from center of head towards front of head.
7) Child brings teeth of comb completely through hair in the center of the head using many strokes from center of head towards front of head.
12) Child combs hair on the opposite side of head by bringing teeth of comb to one-fourth of the way through hair from top side to bottom of one side.
8) Child combs hair on one side of head by bringing teeth of comb one-fourth of the way through hair from top side to bottom of one side.
11) Child brings teeth of comb completely through hair.
9) Child combs hair on one side of head by bringing teeth of comb to one-half of the way through hair from top side to bottom of one side.
10) Child combs hair on one side of head by bringing teeth of comb to three-fourths of the way through hair from top side to bottom of one side.
13) Child combs hair on opposite side of the head by bringing teeth of comb to one-half of the way through hair from top side to bottom of one side.
16) Child combs rear portion of hair by bringing teeth of comb one-fourth of the way through hair from top rear of head to bottom rear of head.
14) Child combs hair on opposite side of the head by bringing teeth of comb to three-fourths of the way through hair from top side to bottom of one side.
15) Child brings teeth of comb completely through hair.

Washing Dishes

Transparency No. 27

Behavioral Objective — All dishes and silverware being in the sink, the subject will wash and rinse all of them 90% of the total trials in a six week period.

Steps:

1. Grasp hot water knob with left hand.
2. Turn knob towards self so water cuts on.
3. Let water run until warm (test by leaving hand under running water).
4. Grasp the stopper(s).
5. Place stopper(s) over drain (drains if using a 2-section sink) to stop sink up.
6. If using a 2-section sink, fill left side with warm water for rinsing dishes. If not, fill a large container with warm water and place it in the sink or to the side of the sink.
7. Grasp detergent bottle.
8. Turn bottle upside-down over sink of running water.
9. Squeeze bottle until sufficient amount of detergent runs into sink of water.

10. Turn bottle right-side up.
11. Place detergent back down beside sink.
12. Let water run until sink is filled.
13. Grasp hot water knob with left hand.
14. Turn knob away from self until water cuts off.
15. Put hand in water.
16. If water is too hot, grasp cold water knob with right hand.
17. Turn knob toward self so water cuts on.
18. Let water run until water is at a comfortable temperature (test water number of times by dipping hand in water).
19. Grasp cold water knob with right hand.
20. Turn knob away from self until water cuts off.
21. Grasp sponge with dominant hand.
22. Grasp a dish or piece of silverware with other hand.
23. Using some pressure, wipe dish with sponge until all traces of food are washed off.

24. Dip dish into unsoapy rinse water until all traces of soap suds are rinsed off.

25. Place dish sturdily in drying rack.

26. Repeat 22 - 25 until all dishes are washed.

27. Squeeze excess water out of sponge.

28. Put sponge down on side of sink.

29. Grasp stopper.

30. Pull stopper out of drain.

31. Place stopper on side of sink (let all dirty water run out).

32. Repeat 28 - 31 for left side of sink for rinse water or grasp container of rinse water and pour into sink.

33. Dry hands on towel.

Dinner

Hamburgers

1. Take a small chunk of hamburger in your clean hands.
2. Make it flat.
3. Make it round.
4. Put the round and flat hamburger in a frying pan.
5. Put the frying pan on a burner.
6. Turn the burner on to HIGH.
7. Turn the hamburger when the bottom turns brown.
8. Brown the other side.
9. Salt and pepper.
10. Turn the burner to OFF.
11. Put hamburger on a hamburger roll.
12. Serve with catsup and mustard.

Making Bed

Transparency No. 31

Behavioral Objective -

Given a single twin bed with a covered pillow, fitted sheet, and spread, the student will be able to make up the bed in 15 minutes, 95% of the time.

Prerequisites -

1) **The student knows right sides from left sides.**
2) **The student knows where head of bed is and foot of bed is, also top from bottom.**

---

1. **Take pillow off bed.**
2. **Place pillow on floor.**
3. **Stand on left side of bed.**
4. **Grasp top left edge of sheet.**
5. **Cover top left edge of sheet over top left side of bed.**
6. **Walk down to the foot of bed.**

7. Grasp bottom left corner of sheet and cover bottom left side of bed.

8. Walk around to the right side of bed.

9. Grasp top right edge of sheet over top right side of bed.

10. Walk down to the bottom of the bed.

11. Grasp bottom right corner of sheet and cover bottom right side of bed.

12. Smooth out all wrinkles.

13. Take spread in hands.

14. Stand on left side of bed.

15. Grasp top left edge of spread.

16. Pull top left edge of spread to head of bed.

17. Walk down to foot of bed.

18. Grasp left corner of spread and cover bottom left side of bed.

19. Walk around to the right side of bed.

20. Grasp top right edge of spread over top right side of bed.

21. Walk down to the bottom of the bed.

22. Grasp right corner of spread and cover bottom right side of bed.

23. Walk up to the head of the bed.

24. Fold top area of spread to the right side of spread.

25. Pick up pillow.

26. Place pillow in the center of the bed at the head of the bed.

27. Grasp edges of spread which have been folded.

28. Cover the pillow with the spread.

29. Get left spread edges even with the floor.

30. Walk to right side of bed.

31. Grasp the top right edges of the spread.

32. Get the right edges of spread even with the floor.

33. Use both hands and tuck excess spread material under pillow until all wrinkles are gone.

A Sample Task Analysis: Brushing Teeth

1. Remove toothbrush and toothpaste from cup.
2. Unscrew toothpaste cap.
3. Squeeze appropriate amount of toothpaste onto brush.
4. Lay toothbrush down.
5. Screw cap back on tube.
6. Pick up brush in preferred hand.
7. Lean over sink.
8. Brush in down motion over top teeth from one side of mouth to the other.
9. Spit out excess at least once.
10. Brush in up motion over bottom teeth from one side of mouth to the other.
11. Spit out excess at least once.
12. Brush in down motion over back of top teeth from one side of mouth to the other.
13. Spit out excess at least once.
14. Brush in up motion over back of bottom teeth

from one side of mouth to the other.

15. Spit out excess at least once.

16. Brush back and forth over crowns of top teeth from one side of mouth to the other.

17. Spit out excess at least once.

18. Brush back and forth over crowns of bottom teeth from one side of mouth to the other.

19. Spit out excess at least once.

20. Pick up cup.

21. Turn on cold water faucet.

22. Fill cup with water.

23. Rinse mouth with water.

24. Spit out excess at least once.

25. Pour excess water out of cup into sink.

26. Replace cup next to sink.

27. Rinse toothbrush in water.

28. Turn off cold water faucet.

29. Replace brush and paste in cup.

Task: Folding Paper

1. **Objective:**
   ***Given a piece of 8½" x 11" paper, the student will fold that paper correctly, completing 14 of the 15 steps, 8 out of 10 trials, for 5 consecutive days.**

2. **Task Analysis:**

   1. **Look at paper.**
   2. **Reach hand toward paper.**
   3. **Touch paper.**
   4. **Grasp one end of one paper with both hands.**
   5. **Hold that end of paper up.**
   6. **Move end of paper down so that end touches approximately middle of paper.**
   7. **Put one hand on end of paper and other hand on where fold is and crease paper so that a fold is made.**
   8. **Reach for top of paper or other end.**
   9. **Touch paper.**
   10. **Grasp end of paper.**

11. Hold that end of paper up.

12. Move end of paper down so that the end being held is approximately touching the fold at the other end of the paper.

13. Make crease in paper so that one paper is now folded.

14. Move one folded paper toward box holding folded papers.

15. Move folded paper over to box.

16. Put one folded paper in box holding folded papers.

Instructional Model in Implementing Task Analysis

1. Present material to child.

   (variables include: number of trials, length of trial, type of instruction, model, or assistance utilized, amount of material presented, 1:1 or small group, etc.)

2. Child
   - a. Responds correctly
   - b. Responds incorrectly
   - c. Does not respond

3. If responds correctly, a positive consequence may be provided: (variables include: feedback, edible, social, immediacy of reinforcement, etc.)

If not, repeat training sequence

Positive Reinforcement

1. **Definition: a (positive) event or consequence which makes a behavior occur more frequently**

2. **Reinforcement Contingency: the relationship between behavior and positive consequences**

   Example of Positive Reinforcement:

   - **If Jo stays awake, then she can leave 15 minutes early.**

   - **If Debbie comes to class every time, then she does not have to take the final quiz.**

3. **How to Select Reinforcers:**

   a. **Observe child and record his/her material and activity preferences**

   b. **Trial-and-error**

   c. **Reinforcement menu**

Considerations in Using Positive Reinforcement

-Immediacy
-Schedule
-Amount
-Pairing
-Proximity
-Labeling
-Expressiveness

Illustration 1

Immediacy - Means providing Rf immediately after correct child response

a. How quickly — 1-2 seconds when new skill is being taught

b. Why — so child can rapidly connect correct response with positive consequence

Example: Toilet Training

1. Child is put on toilet.
2. Child eliminates.
3. Aide comes into bathroom to talk with teacher.
4. Ten seconds later aide leaves and child is then reinforced for picking nose.

Illustration 2

Schedule -

Means how often child gets Rf for a correct response

a. **Continuous - every correct response gets Rf**

b. **Intermittent - child's correct responses are reinforced periodically**

c. **When is a continuous schedule best?**

When teaching a new skill.

When is an intermittent schedule best?

When child has reached criterion and teacher wants to maintain responses.

Example: Teaching doll play

1. **Each correct response in doll play task analysis is reinforced by teacher when the response is made**

Illustration 3

Transparency No. 42

Pairing - Refers to giving two reinforcers at approximately the same time or in close temporal proximity

Examples:

1. Child eliminates in toilet	1. a. Fruitloop given b. Praise and hug
2. Child completes 10-min. of on-task work	2. a. Token given b. Praise given
3. Child self-initiates on Jack-in-the-box toy	3. a. Jack-in-the-box pops up b. Teacher and peers applaud

- With pairing of reinforcers - one reinforcer strengthens the other

- Good way of fading or reducing use of consumable reinforcers

Illustration 4

Transparency No. 43

Proximity - Showing the child the reinforcer or putting it in sight of the child.

Example: Increasing work production rate

1. **Individual selects reinforcer (red lifesaver)**
2. **Individual begins work with Rf in front of him/her**
3. **Individual meets criterion**
4. **Individual receives Rf**

Caution! - This can boomerang if child goes berserk after food

Illustration 5

Labeling - Telling child why he/she was reinforced when Rf is given.

Why? - Many severely involved children will think that they are being reinforced for something other than what the teacher perceives

Example: Sitting in seat

1. **Child in seat quietly - but looking at peers fighting in corner**

2. **Teacher says to child: "Good job of sitting in your seat, Johnny!"**

Illustration 6

Expressiveness - Getting excited and showing verbal and facial response to child's correct response;

- **"Way to go!"**
- **"That's great, Johnny!"**
- **"Tremendous!" "Far out!"**

What happens if you don't do this consistantly with severe, profound, multi-handicapped individuals:

A) Social Reinforcement is ineffective

B) Children must rely on edibles and liquids for Rf

Expressive social reinforcement is HARD WORK - It may take a while to get over an initial feeling of foolishness - But it's important.

Teaching Skills

1. Give instructions first - head on and straightforward
2. Use modeling next with instructions
3. Use physical guidance finally

Prompting - providing physical or verbal assistance

Fading - gradual removal of assistance as person becomes proficient

Backward Chaining vs. Forward Chaining

Amount of Practice

Feedback

Attention

Coding

Stimulus Fading

Gradual removal of extra stimuli or prompts so that the student is responding to the environmental cues alone.

1. **Minimizes chances of errors**
2. **Reduces likelihood of individual "tuning out" due to repeated failure**
3. **Gradually directs student's attention to the relevant environmental stimuli**

Instruction Giving Guidelines

1. Get child's attention.
2. Straightforward - eye contact.
3. Clear distinct voice.
4. Minimize number of words.
5. Command rather than question.
6. Be consistent.

Work Sheet
Examples

1. John, how about combing your hair?

2. Sam, go to the table and sit down, it's time to have cookies and milk.

3. Julie, be a nice girl and go get a book.

4. Who wants to go to the bathroom?

5. Sally, put your hands in your lap and sit quietly until it's time for class.

6. Why don't you get out your coat?

Arranging Materials Before Instruction

1. Prepare materials before presenting--------
   Avoid "make-shift" instructional materials

2. Prepare data sheets for ease of recording

3. Arrange the environment so as to maximize efficient motor movements

   a. For child

   b. For teacher

4. Provide easy access to reinforcers

5. Minimize efforts involved in transitioning to new activities

6. Schedule programs carefully

Considerations in Program Evaluation

1. Frequency of Evaluation

   - should be frequent enough so that teacher can monitor child's progress

   - should be frequent enough so that necessary modifications in materials/procedures can be made

2. Reliability of Evaluation

   - question of accuracy of observation of child

3. Validity of Evaluation

   - the test should be a fair "cultural" assessment tool for this child

4. Who Should Conduct Evaluations?

   - variety of professionals initially

   - parents

   - teacher and aide

What Types of Program Evaluation Designs Are Available?

1. The A-B Design

   Baseline-Treatment

2. The Changing Criterion Design

3. The ABAB Design

   Baseline-Treatment-return to Baseline-Treatment

4. The Multiple Baseline Design

   - Across Behaviors
   - Across Places or Time
   - Across Persons

1. The A-B Design also known as Pretest-Teach-Post Test

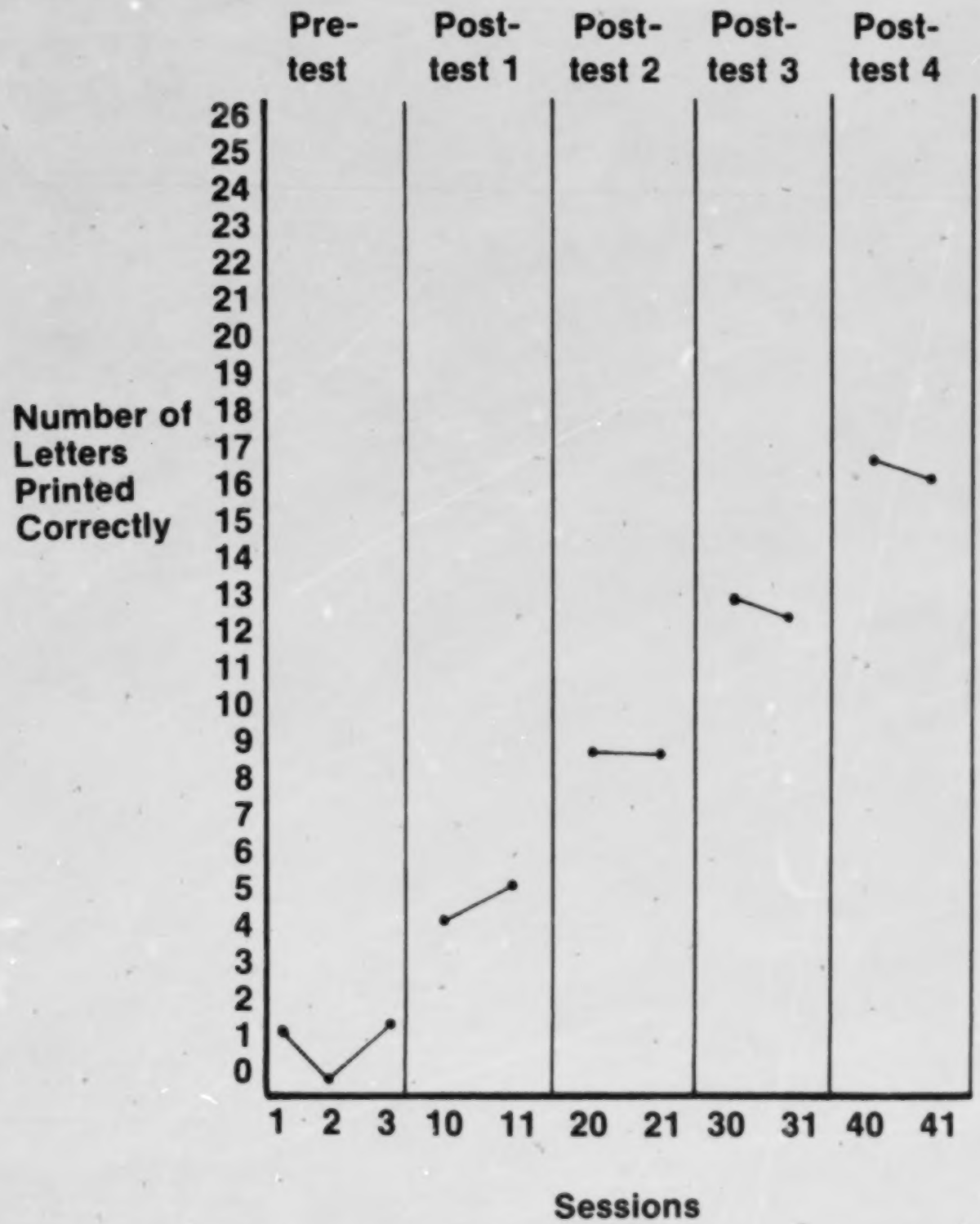
Characteristics of:

- Easy to administer
- Economical in time, yet still allows a frame of reference for evaluation
- Can be used for a whole class or 1 child alone

Major Limitation:

- Without a control group that does not receive treatment, assumption cannot be made that treatment caused change in dependent variable.

Pretest-Teach-Post-test Program Design



2. The Changing Criterion Design

Major Advantage -

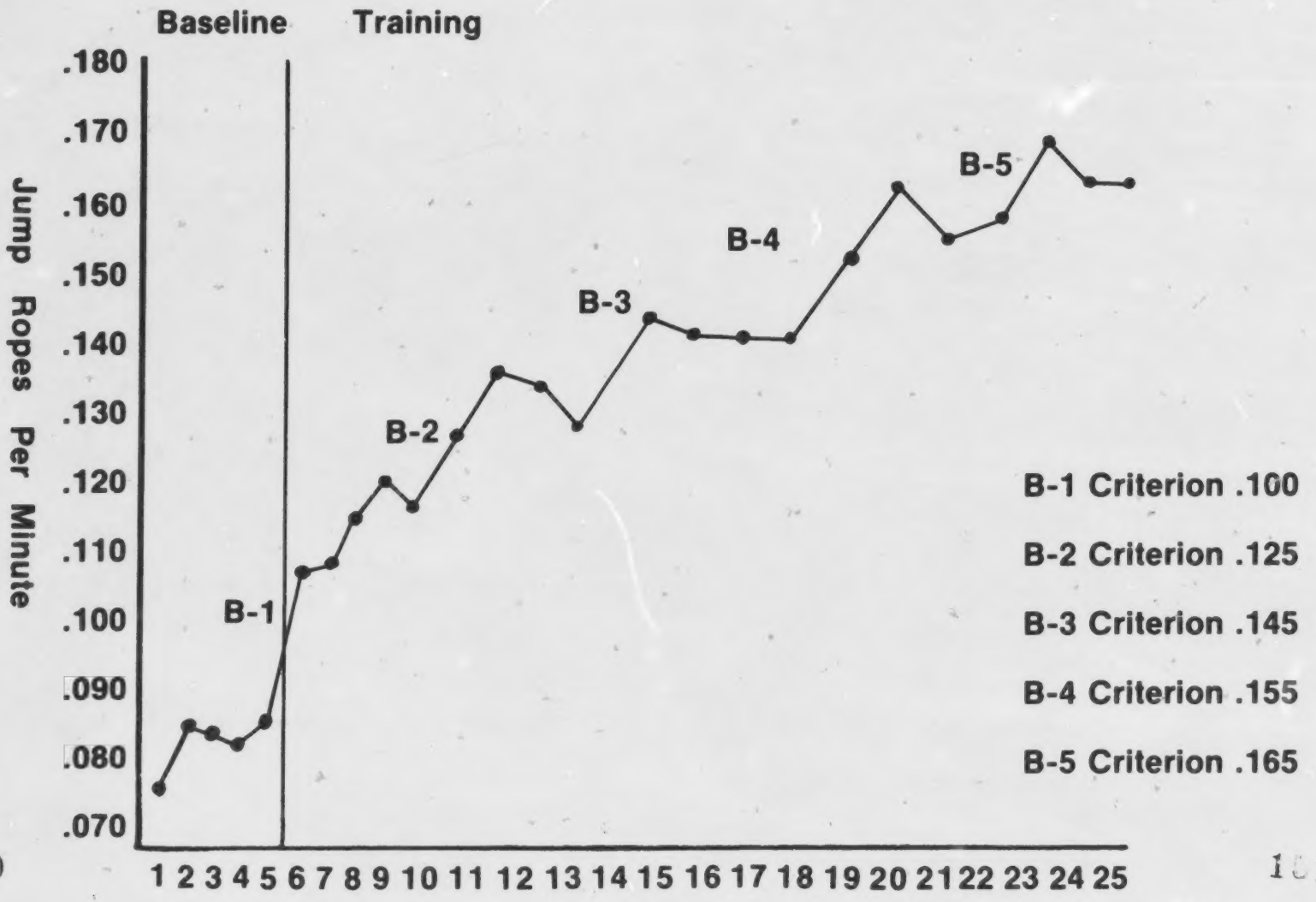
Good for on-going evaluation of behavior shaping programs

Examples:

- **Gradually decreasing weight**
- **Gradually increasing jogging distance**
- **Gradually increasing productivity**

Program Design for Evaluating Work Productivity

Transparency No. 56



1-201

3. Reversal Design

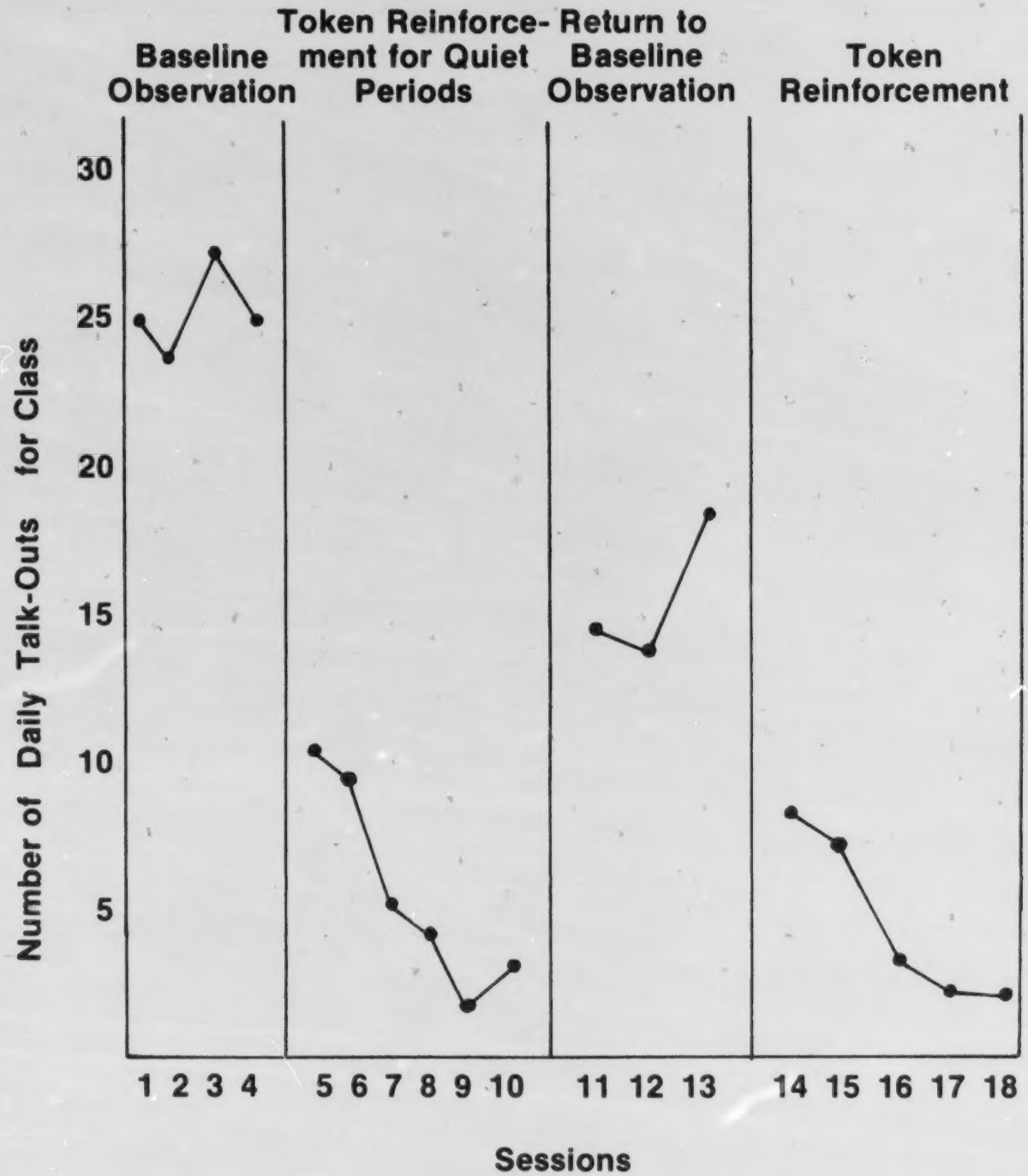
Major Advantage -
Excellent means of evaluating functional relationship between independent (treatment) variable and dependent variable (what you're measuring) -

The brief reversal allows teacher to assess whether what he/she is doing is really the reason for behavior change in child.

Major Limitation -
Withdrawing treatment variable that is working may be seen as undesirable or unethical

Transparency No. 58

Reversal Design for Evaluating Effects of Token Reinforcement Procedure

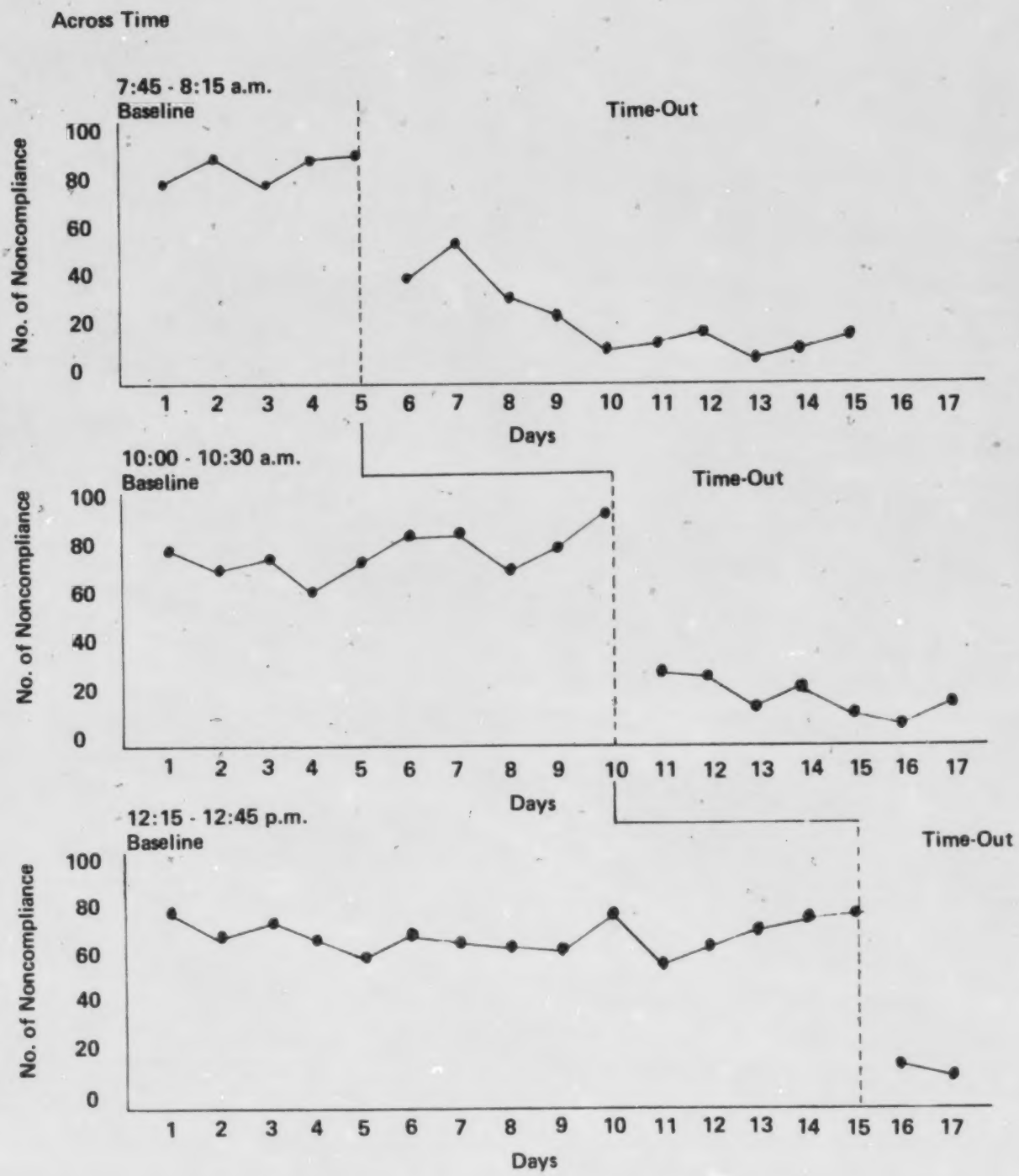


4. Multiple Baseline Designs

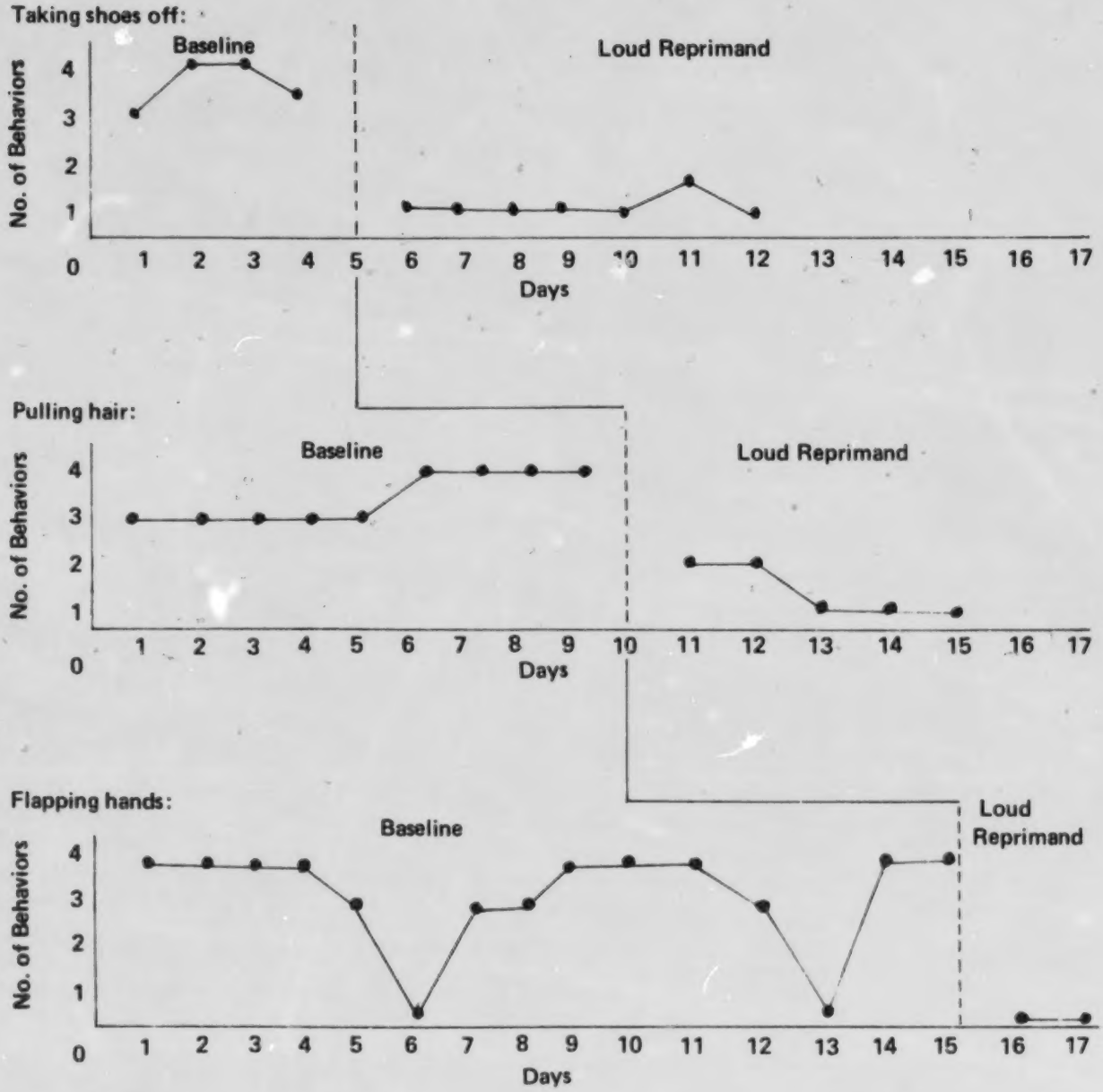
- Demonstrates functional relationship between treatment variable and dependent variable without reversing conditions
- Can be used across students
- Can be used across different times of day
- Can be used across different environments

Multiple Baseline Across Time Program Design

Transparency No. 60



Multiple Baseline Across Behaviors Program Design


Taking shoes off:
Baseline
Loud Reprimand
No. of Behaviors
0 1 2 3 4
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Days
Pulling hair:
Baseline
Loud Reprimand
No. of Behaviors
0 1 2 3 4
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Days
Flapping hands:
Baseline
Loud Reprimand
No. of Behaviors
0 1 2 3 4
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Days

PL 94-142: THE "INDIVIDUALIZED EDUCATION PROGRAM"

The INDIVIDUALIZED EDUCATION PROGRAM (IEP) must include. . .

1. "A statement of the child's present levels of educational performance, including academic achievement, social adaptation, prevocational and vocational skills, psychomotor skills, and self-help skills:"

2. "A statement of short term instructional objectives, which must be measurable intermediate steps between the present level of educational performance and the annual goals:"

3. "A statement of annual goals which describes the educational performance to be achieved by the end of the school year under the child's individualized education program;"

4. "Objective criteria, evaluation procedures, and schedules for determining, on at least an annual basis, whether the short term instructional objectives are being achieved;"

5. "A list of the individuals who are responsible for implementation of the individualized education program;"

6. "A statement of specific educational services needed by the child (determined without regard to the availability of those services) including a description of:
   A. All special education and related services which are needed to meet the unique needs of the child, including the type of physical education program in which the child will participate, and
   B. Any special instructional media and materials which are needed;"

7. "The date when those services will begin and length of time the services will be given;"

8. "A description of the extent to which the child will participate in regular education programs:"

9. "A justification for the type of educational placement which the child will have."

Source: Federal Register, 1976 (December 30), 41 (No. 252), Part IV, Section 121a.225, p. 56986.

TEST ANALYSIS FORM

Describe the test in terms of the following criteria. Try to use specific examples when applicable.

Name of test:

Author:

Address for ordering:

Publisher:

Date published:

Who is qualified to administer this test?

Population for whom the test is intended:

Is this test standardized?

If so, on what population was it standardized?

List the components:

Give a general description:

Length of time needed to administer the test:

Sensory modalities used:

reception
response

Materials needed:

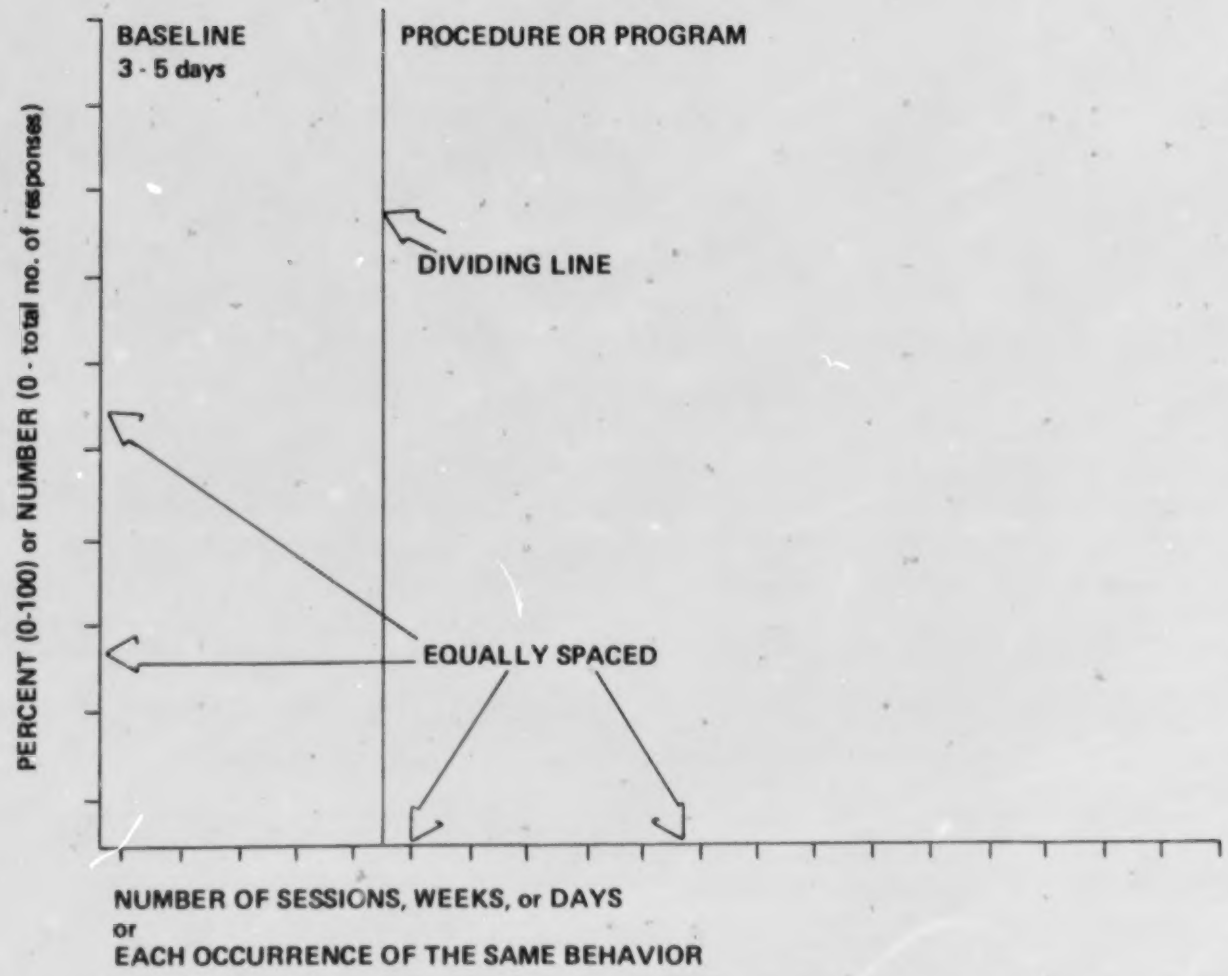
Approximate cost:

What specific information is gained about the individual taking the test?

Other:

Advantages:

Disadvantages:



1-217

Worksheet No. 2

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GRAPHING WORKSHEET
DATA FOR GRAPH ONE
NUMBER EACH DAY

Monday, January 7	3
Tuesday, January 8	4
Wednesday, January 9	3
Thursday, January 10	4
Friday, January 11	5
Saturday, January 12	2
Sunday, January 13	3
Monday, January 14	2
Tuesday, January 15	2
Wednesday, January 16	3
Thursday, January 17	1
Friday, January 18	2
Saturday, January 19	1
Sunday, January 20	1
Monday, January 21	3
Tuesday, January 22	1
Wednesday, January 23	0
Thursday, January 24	0
Friday, January 25	1
Saturday, January 26	0

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GRAPHING WORKSHEET

DATA FOR GRAPH TWO

Total Number of Requests	Number of Requests Followed
10	2
8	2
5	3
15	3
15	2
15	3
10	4
14	6
15	10
15	4
20	15
15	13
16	15
16	12
15	15
14	14
18	18

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GRAPHING WORKSHEET

DATA FOR GRAPH THREE

LENGTH OF TIME CHILD SITS EATING AT DINNER

Day 1	50 minutes
Day 2	54 minutes
Day 3	50 minutes
Day 4	60 minutes
Day 5	60 minutes
Day 6	50 minutes
Day 7	60 minutes
Day 8	40 minutes
Day 9	10 minutes
Day 10	15 minutes
Day 11	15 minutes
Day 12	25 minutes
Day 13	15 minutes
Day 14	15 minutes
Day 15	16 minutes

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Worksheet No. 6

BEHAVIORAL OBJECTIVES ACTIVITY SHEET

Goal _____ Area _____

Long Range Objective _____

_____

Short Range Objectives

	Who	Behavior	Conditions	Criteria
Objective 1				
Objective 2				

BEHAVIORAL OBJECTIVES

Worksheet No. 7

Typical complaints of teachers or parents about student - Convert these to behavioral objectives for possible programs.

Group 1

(a) "The student is unable to keep working without supervision."
(b) "The student can't get along with others."

Group 2

(a) "The student has bad eating manners."
(b) "The student doesn't follow instructions."

Group 3

(a) "The student never listens to what I say."
(b) "The student is a behavior problem."

Group 4

(a) "That student always has her tongue out and drools."
(b) "The student should gain greater independence in grooming skills."

Group 5

(a) "That student must not be so shy with other children during play time."
(b) "That student never finishes his/her work."

Group 6

(a) "That student has few appropriate work skills."
(b) "The student's quality of work is inconsistent."

INSTRUCTIONAL TECHNIQUES: CASE STUDIES

1. Kathy is a new enrollee in the Henrico Adult Activity Center who has been labeled as being severely retarded. The coordinator of this program is an outstanding individual who has taught Kathy how to put together and package shower heads through task analysis step-by-step instruction. The major difficulty he faces with her, however, is keeping her "motivated" to stay "on-task". What strategies can be employed to help the coordinator?

2. Penny is a part-time enrollee in the Richmond Adult Activity Center. She has already learned basic domestic skills while living at home. These skills have been helpful in her placement as a weekend worker at the local Holiday Inn. The problem is that Penny fails to get to work on time and does not do nearly as good a job at the Holiday Inn as in the Center or at home. What can the Activity Center staff and Rehabilitation Counselor do to help Penny improve her work habits?

3. James has been referred to the Johnstown Activity Center. He has been given the work assignment of putting together floor pulleys. Unfortunately, John has had considerable difficulty in completing this task correctly. What teaching methods can be used to help him acquire this task?

BEHAVIORAL TERMINOLOGY

Terminology

a) *antecedent events* - stimuli (e.g., cues, prompts, objects, events, people, etc.) which precede the occurrence of a behavior.

b) *consequent events* - stimuli (e.g., objects or events) which immediately follow the occurrence of a behavior. Consequent events may increase the probability of occurrence of the behavior they follow, may decrease the probability of occurrence of the behavior they follow, or have no apparent effect on the occurrence of the behavior they follow.

c) *tangible reinforcers* - objects (e.g., food items, liquids, toys, tokens, stars, etc.) which immediately follow a behavior and increase the probability of future occurrence of the behavior they follow.

d) *social reinforcers* - any type of attention from another person (e.g., praise, smiles, hugs, spankings, frowns, reprimands) which immediately follow a behavior and increase the probability of future occurrence of the behavior they follow.

e) *shaping* - a training procedure which involves selecting a behavior that in some way approximates the desired target behavior and differentially reinforcing successive approximations to that target behavior.

   (successive approximations - responses which increasingly resemble the terminal behavior which is being shaped)

   differential reinforcement - given two or more physically different responses, one response is reinforced and the other(s) are not; reinforcing a response in the presence of one stimulus and not reinforcing it in the presence of another)

f) *chaining* - a training procedure which involves teaching a fixed chain or sequence of responses in which each response in the chain serves as a cue for the next response in the chain.

g) *cue* - an antecedent response which occasions or prompts a desired response.

h) *fading* - (a) gradually removing the cues, prompts, stimuli, etc., which have been signaling the occurrence of a desired response; (b) the gradual removal of reinforcement as in reducing the amount of social or tangible reinforcers the student is given.

i) *correction procedures* - specific procedures to teach a correct response (e.g., shaping, verbal correction, modeling, etc.) when (if) the student makes an incorrect response.

j) *stimulus control* - when the presence of a particular stimulus sets the occasion for a particular response, stimulus control has been established. A response is performed when in the presence of a particular stimulus, but not in its absence.

   (discriminative stimulus - S^D - a stimulus which signals that a certain response will be reinforced)

k) *verbal or motor imitation training* - a specific form of discrimination training consisting of: 1) the teacher demonstrating the behavior (a verbal response or a motor response); 2) the student copying the behavior demonstrated; and 3) the teacher reinforcing an appropriate student imitative response.

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SYSTEMATIC INSTRUCTION

Defining the Good Teacher

Valerie Lynch
Corrine McGuigan
Sue Shoemaker

What is "good teaching"? Perhaps most of you recall several teachers that you considered excellent. What did these teachers have in common?

Probably a teacher you considered to be "good" taught a subject that you liked or one in which you performed well. It seems only natural that in classes where children perform well, they receive positive attention for their work from the teacher, peers, or parents and/or delight in the knowledge that they are good pupils. Such attention and positive feelings can easily be translated into regard for the teacher as excellent or for the subject matter as fascinating.

But what about the class in which you did not perform well, but did consider the teacher to be a good one? The teacher of that class probably made you feel that the information you were learning was meaningful and that you were doing a good job, even though you weren't the "star pupil".

A common trait of "good teachers" might well be stated as "the ability to recognize that a pupil is performing to the best of his or her ability, to communicate approval of this effort and to encourage continuance of such effort." While not all teachers are destined for "stardom" in the field of education, it seems highly possible to provide teachers with the skills necessary to become good teachers as we've defined it, that is, to provide for each pupil a learning environment which leads to optimal performance.

It is easy to visualize being a good teacher for pupils who are interested, capable, communicative, and enthusiastic but difficult to imagine it for those who are indifferent or slow, who have been labeled "problem children," or who are severely, profoundly, or multiply handicapped. Yet legislation, parental pressure, and professional standards dictate that administrators and teachers provide for each pupil the educational competencies which lead to optimal performance by each child.

Good Teaching: The Systematic Approach

The purpose of this paper is to introduce a process which provides teachers with a systematic approach to the education of pupils —— one which attempts to ensure that teachers are providing relevant educational experiences for their pupils and that pupils are performing to the best of their abilities. This process is known as systematic instruction, the systematic instructional process, or the systematic instructional model. Within the scope of this paper it is not possible to provide you with sufficient information about each component so that you could readily implement the process. Rather, the purpose here is to familiarize you with the components of the systematic process and increase your understanding of their function.

Over the years various curricula and instructional methods have been introduced to meet the educational needs of both teachers and pupils. While some methods and materials have proved highly successful for large numbers of pupils, none have proved successful for all children. Slowly, there has emerged a recognition that individual pupils vary according to: (1) the amount of time which they need to acquire skills, (2) the methods by which they most readily acquire and retain skills, and (3) the readiness they demonstrate in acquiring new skills at different ages. Therefore, to ensure optimal

From the Experimental Education Training Program – An Inservice Program for Personnel Serving the Severely Handicapped. Norris G. Haring, Editor. Copyright 1977, University of Washington. Reprinted by Permission.

educational opportunity for pupils, any system adopted by educational personnel should allow flexibility to meet the unique learning characteristics of pupils. Thus, educational practices must be viewed as a part of the total educational environment which reflects good teaching and meaningful learning.

Defining Systematic Instruction

Systematic instruction is a procedure designed to create an optimal learning environment. It is a process in which teachers follow a set of guidelines that direct their teaching activities regardless of specific curricula or techniques. Probably the most profitable way of finding out just what constitutes systematic instruction is to forget all the words and phrases you have hitherto associated with it. Start thinking of systematic instruction as a *process* –– a process which directs the optimal functioning of a learning environment.

Unlike models which focus on abstract theories or hierarchies not directly related to classroom instruction, in this paper systematic instruction is a process which teachers and administrators can comprehend and utilize. Systematic instruction is the utilization of practices such as proper assessment and accurate programming. We have attached labels to components of the process for identification and communication purposes. Focus your attention on the function of each component as opposed to the label. As you do so, you may find that you are currently incorporating many aspects of systematic instruction. Likewise, you may encounter others, using different terminology, who describe and support the same process.

Stages in the Systematic Instructional Process

Whatever the terminology, the systematic process should include these stages: (1) assessment of general and specific skills; (2) establishment of long term objectives or goals for each skill area or behavior of concern; (3) establishment and sequencing of short term objectives (steps leading to each long term objective); (4) development and writing of an instructional plan; (5) development and writing of measurement procedures for each behavior; (6) implementation of the instructional plan and measurement procedures; (7) modification of the plan based on data; and (8) evaluation of overall pupil progress. By "teaching through these stages" educators create and participate in systematic instruction. In the beginning and in the end, they optimize the learning environment for each pupil. At the same time, parents and administrators are provided precise statements of educational objectives and accurate and meaningful documentation of each learner's progress toward these objectives. In this age of federal grants, state regulations, and parental concern for quality education, this documentation provides an accountability system.

Components of the Systematic Instructional Process

In the following section the significant function and inter-relatedness of each component is briefly described. This should help you understand the process when you hear it referred to by different names.

Assess. Initial assessment, or finding out just what it is a child can or cannot do, is the first task to be completed by a teacher who desires to develop relevant educational experiences for his or her pupils. Obviously, good teaching implies teaching what needs to be learned –– not just placing each learner in the first chapter of a predetermined text or the first step in a predetermined curriculum. Initial assessment means contacting persons (previous teachers, other involved professionals, and parents) and reading records to find out as much about a learner as possible. It means administering formal tests (diagnostic or developmental) when available scores on such tests are out-dated or invalid. Initial assessment likewise means administering teacher-made tests, specific skill tests or sequence-related tests to determine precise levels and conditions of learning for each student. And last, but surely important, is the need for the teacher to spend some time meaningfully observing the behavior of the student. Through personal contact with former teachers or through school records, a teacher might learn that a pupil daydreams a lot or exhibits no head control. However, this is not

relevant to classroom programming. Through meaningful observation, specific information such as "the pupil continually leaves his or her seat to stare out the window during math" or "the pupil can maintain head control for two seconds" can be collected. This information is pertinent in planning programs for the learner.

Establish Long Term Objectives. Once a teacher has gathered general information and precise data on what a child can do, the teacher should compile this assessment information and use it to write long term goals or objectives. To be relevant to the development of classroom programs, long term objectives must be written to include the learner, the desired behaviors for the academic year, the conditions under which the learning will occur, and the criteria for success. The importance of this step cannot be overstated. As difficult as long term objectives are to write, they provide the teacher, the parents, and the administrator, and, in some cases, the learner with specific and concrete statements of what skills a child should have at the end of nine months.

Consider taking a trip. Contrast the difference between taking a trip having specified your destination and taking a trip with no special goal in mind -- for example, leaving Seattle this morning with a goal to reach Mexico City by nightfall three days hence, as opposed to merely leaving Seattle. Without a goal you know neither which direction to go nor how fast to travel. having established a goal you know both these facts (head south and really hustle). With this information you can judge whether or not the direction and the rate at which you are traveling will get you to your final destination.

It all depends on where you are, where you want to go, and when you want to get there. In teaching, initial assessment information tells you where you are, while long term objectives identify where you're going and when you plan to arrive. These two bits of data tell you a good deal about how fast you need to travel, and help you to set intermediate goals or short term objectives. In summary, long term objectives identify important areas for educational programming and help teachers focus on the needs of the learner.

Establish Short Term Objectives. Sequencing approximations toward long term objectives -- or the establishment of short term objectives -- is the next step in the process Writing and sequencing short term objectives outlines the steps and procedures which lead to attainment of the long term goals. Usually it is advisable to write short term objectives for short periods of time -- anywhere from one week to three month periods -- and to write them in precise, behavioral terms specifying the learner, the exact behavior, the conditions under which the behavior will occur, and the criterion for success.

By teaching to a series of short term objectives, teachers are more likely to proceed systematically and are less likely to engage in random instruction. Again, by writing very specific objectives for short periods of time, everyone involved with the learner (and for a higher functioning pupil -- the learner himself or herself has a good idea of what needs to be learned. Because short term objectives include specific criteria for success, the teacher will also know if and when information or skills are learned.

Develop and Write an Instructional Plan. The fourth step in the process is the development of an instructional plan directly related to each short term objective. This step is designed to ensure that each pupil proceeds from "where he/she is now" to the successful attainment of each short term objective. Several major areas of decision-making are incorporated in this step. These are the selection and specification of: (1) curriculum, (2) instructional procedures, and (3) reinforcement.

Choosing appropriate and functional instructional materials is not an easy job. Most importantly, it means ensuring that the content of materials matches that of the objectives specified for the pupil. It means knowing what materials are available in the school and district, how much money is available for purchase of new materials, and the local school district's most recent policy for ordering materials. It means having the skills to create specific materials or a curricular sequence when none are available and to modify existing ones to meet specific pupil needs. Teachers and administrators also need curriculum evaluation skills; most significantly, they need to know what materials can be used or developed to meet specified objectives.

Now having selected exactly what it is you will teach, how are you going to deliver instruction? What tactics or procedures will most contribute to learning for each pupil? The selection of appropriate instructional procedures is as important to the systematic plan as the selection of

materials. Instructional procedures include specifying what the teacher or pupil will do prior to exhibiting the desired behavior. For example, drill, demonstration, and physical assistance to completion of the desired behavioral sequence are common instructional tactics. Instructional procedures also include those tactics to facilitate learning which occur following a behavior. Correction procedures, error drill, and immediate feedback on performance are common examples. Important to remember in the choice of instructional procedures is the fact that not all pupils respond equally well to the same procedures. It is critical to observe each pupil in order to determine the effectiveness of the procedures you have chosen and to change those instructional procedures which do not facilitate learning.

The appropriate selection of reinforcement can significantly increase learning and, therefore, requires careful consideration by the teacher. However, all too often we forget that what is reinforcing to us (e.g., chocolate chip mint ice cream, a pay check, chocolate chip mint ice cream, words of praise from the principal, chocolate chip mint ice cream, etc.) may not be reinforcing to our pupils. Reinforcement is defined as an event which immediately follows a response and increases the probability that the response will occur again. Only if this pattern emerges with an individual pupil can we say that the consequent event is reinforcing.

The development and writing of an instructional plan is designed to provide the teacher with a systematic way of viewing and describing the critical variables within a particular teaching plan. By systematically planning a program and recording all crucial elements in the program the teacher is not only familiar with each variable of the present program, but is also able to make relevant decisions about program changes if the desired objective is not being achieved. Specification of the instructional program also permits others to understand exactly what the pupil is expected to do, how the work is presented to the pupil, and the educator's responsibilities for the program.

Random selection of curriculum, instructional procedures, and/or reinforcement results in random instruction -- random learning. Successful completion of the first three steps in the systematic instructional model facilitates the implementation of this fourth step. Through initial assessment, the teacher discovers what the learner can do and what he/she can't do. Based on this information, the teacher writes appropriate long and short term objectives. Having completed these steps, it is significantly easier to develop and write an instructional plan relevant to the learning needs of each pupil.

Develop and Write Measurement Procedures. The development and specificaton of appropriate measurement procedures mean that for every objective written, whether it be long or short term, there must be a measurement system for showing whether the pupil is reaching that objective. Notice the wording: "reaching" rather than reached. Measurement must be present tense, not past tense. To be useful for a teacher, a measurement system should follow the learner's progress from the time the program is implemented to attainment of the objective. The measurement system should provide the teacher with continuous information so that if a pupil is having difficulty on a task, program changes can be made immediately. Recall the old saying, "Don't wait until the horse is stolen to shut the barn door." If a teacher waits until the end of a unit of instruction to measure a pupil's progress, it may already be too late to avoid failure. Then it is a matter of remedial work to bring the pupil up to mastery; meanwhile, there is new learning that should be taking place.

Establishing measurement procedures does not have to be complicated or costly. In many cases, a simple graph of daily scores will provide adequate information; in a few cases more elaborate systems will be required. But whatever type of system is used, it must provide you with this information: Is the learner nearing the established objective? Is the learner regressing or having more problems than success? Is the learner stagnating or showing no growth over a period of days?

A secondary function of measurement procedures is accountability. By showing the teacher how the learner is doing, measurement indicates to the teacher much about the effectiveness of his or her teaching; it gives parents information about the daily or weekly progress of their child; and it informs school principals and district superintendents about the quality of service being provided to the pupils they serve. The same information can be used to tell learners of their progress toward objectives. It can encourage them to become more responsible for their learning behavior.

Implement the Instructional Plan and Measurement Procedures. Now comes the test -- implementing instruction and measurement procedures. This step serves to check the procedures

specified in steps four and five: it is the culmination of all your activities to this point. As you implement the procedures and practices you have so carefully worked out, consider the following questions: (1) Does the written instructional plan include all variables critical to the delivery of the program? and (2) Do the measurement procedures you specified provide information about the pupil's progress? If these questions can be answered with a resounding "yes," your pupil is on the road to a successful learning experience.

Modify the Plan Based on Data. Step seven is the selection and presentation of appropriate interventions. After a teacher collects several days of data, he or she will be able to decide if the learner is performing successfully in the program. If the data reveal that progress is satisfactory, no change or intervention need be made in the established program. However should the learner be failing with the task or progressing too slowly, it is the responsibility of the teacher to alter the program so that the learner succeeds. If, for example, a pupil's daily data indicate that he or she is continually doing poorly on his or her math assignment, the teacher may choose to intervene -- or make a change in the program -- by doing one of several things. The teacher could add more practice time or add additional practice for errors only; he or she could give the pupil an aid, such as an abacus, or make free time dependent on improved math performance. For a "shirt on" program where the data indicate lack of progress the teacher may choose to use an oversized shirt to initially teach the skill. There are many options. These are called instructional interventions and are crucial elements of quality instruction. Without appropriate interventions, good pupils lose valuable learning time and poor pupils continue to fail. With it, every child advances toward his or her own goals successfully.

Evaluate Overall Progress. As in every good and successful program, the last component in the systematic instructional model is the periodic evaluation of overall progress. Continual reassessment of children's performance will keep teachers informed about retention of information and skills. Also, classroom teachers can use retention or maintenance checks to determine how well a child is using learned information and skills in varied or new situations and settings. This information can then be placed in the child's records for the next teacher to review.

Thus, the process is complete with each component serving a vital function within itself and providing continuity and purpose to the whole.

Summary of Steps in Systematic Instruction Process

As can be seen, systematic instruction cannot be readily implemented. To ensure success, both teachers and administrators must:

(1) recognize that appropriate education requires meeting the needs of individual pupils;
(2) recognize that systematic instruction is a process rather than a prescription for the education of children. It provides the guidelines for approaching the education of children, allowing leeway for a variety of teaching styles and content;
(3) recognize that each step included under the heading systematic instruction is necessary for the achievement of an appropriate educational environment for children. Disregard for any one step will significantly decrease the effectiveness of the model and diminish the quality of educational services provided;
(4) be willing to critically analyze and assess their present approach(es) to meeting pupils' needs; and
(5) be willing to devote the time and effort necessary for the implementation of systematic instruction. Initially, the cost will be high. However, as teachers become familiar with the procedures, develop the necessary skills for each of the steps, and observe the efficient and effective learning environment they have created, the results will be impressive.

SYSTEMATIC INSTRUCTION

Step	Reasons	Implementation
Assess	1. to provide information about child's present level of skill development (performance level) in order to ensure that instructional programs are built on acquired skills 2. to provide information to parents, educational personnel and relevant individuals for consideration in educational planning	1. use of child reports - progress reports - medical reports 2. interviews of previous teachers, parents, and other professionals 3. formal testing - diagnostic tests - achievement tests - developmental tests 4. informal testing - teacher-made tests - specific skill tests - sequence related tests 5. teacher observation
Establish Long Term Objectives	1. to provide guidelines for the focus of instruction 2. to provide information to parents, administrators, teachers, and interested individuals as to the direction of educational programs 3. to provide a basis for yearly evaluation of instructional procedures and programs 4. to meet state requirements where necessary	1. write objectives which: - reflect important areas of focus - are written in measurable, behavioral terms - specify: - the learner - the behavior - the conditions - the criteria for success
Establish Short Term Objectives	1. to provide a "plan of action" for attainment of the long-term objectives 2. to provide the basis for specific instructional programs 3. to provide a basis for the evaluation of instructional procedures and programs	1. establish sequence from commercial materials and/or 2. sequence developmental skill areas and/or 3. sequence from least complex to most complex skills and 4. write each short term objective in measurable, behavioral terms specifying - the learner - the behavior - the conditions - the criteria for success

Step	Reasons	Implementation
Develop and Write an Instructional Plan	1. to describe individual teaching programs based on current performance levels 2. to specify programs which will ensure that long and short term objectives are met	1. select and specify materials which are appropriate to the sequence step or specific short term objective - commercial material - teacher-made material - selected teaching procedures 2. select and specify instructional procedures which are appropriate to: - the instructional materials - the learner 3. select and specify reinforcement procedures
Develop and Write Measurement Procedures	1. to describe measurement procedures by which the teacher or other educational personnel can determine whether a child is successfully moving toward the accomplishment of educational objectives	1. select and specify a measurement system which - reflects the behavior specified in long and short term objectives - accurately reflects pupil performance - displays information in a manner which communicates pupil progress
Implement the Instructional Plan and Measurement Procedures	1. to facilitate learning 2. to determine whether a pupil is successfully moving toward the accomplishment of educational objectives 3. to provide objective information to parents, administrative personnel, etc., as to the child's actual performance.	1. present instructional programs 2. implement measurement procedures
Modify the Plan Based on Data	1. to ensure a pupil meets educational objectives 2. to prevent failure	1. antecedent events (materials as well as methods) 2. consequent events or consequences - feedback on performance - reinforcement contingencies
Evaluate Overall Progress	1. to ensure continued evaluation of overall pupil performance 2. to provide summative information for parents and future teachers on the performance levels of pupils	1. establish programs which measure pupil performance through review or maintenance checks 2. periodically re-assess pupil performance

SYSTEMATIC INSTRUCTIONAL PROCESS

Organization Classroom and Management	1. Assess
	2. Establish long term objectives
	3. Establish short term objectives
	4. Develop and write an instructional plan
	5. Develop and write measurement procedures
	6. Implement the instructional plan and measurement procedures
	7. Modify the plan based on data
	8. Evaluate overall progress

THE SYSTEMATIC INSTRUCTIONAL PROCESS CHECKLIST

This checklist is designed to help you realize how much, or to what extent, you already employ systematic instructional procedures.

Assess

Do you find out as much about the child as possible by:

- interviewing previous teachers or associated professionals? _____
- talking with the child's parents? _____
- observing the child in a classroom setting? _____

Do you administer or review the results of:

- any formal tests (diagnostic, developmental, or achievement)? _____
- any informal tests such as
  - teacher-made tests? _____
  - skill specific tests? _____
  - placement tests from various curricula? _____

Establish Long Term Objectives

Using the information gathered from Initial Assessment, do you:

- identify important areas of focus for the year? _____
- set specific goals for the pupil to achieve for the year? _____
- write these goals in measurable, behavioral terms so that they include the learner, the behavior, the conditions under which the learning will occur, and the criteria for success? _____

Establish Short Term Objectives

For each long term objective, do you:

- identify and sequence steps which lead to that objective? _____
- write these intermediate objectives in measurable, behavioral terms so that they include the learner, the behavior, the conditions under which the learning will occur, and the criteria for success? _____

Develop and Write Instructional Plan

Do you establish a program which will help the learner reach each short term objective by:

- identifying or developing materials? _____
- identifying instructional procedures or techniques? _____
- identifying reinforcers? _____

Develop and Write Measurement Procedures

For each short term objective, do you:

- specify what behavior you are going to measure and _____
- choose a measurement system which is compatible with that behavior and which provides you with specific information about the learner's progress toward the objective? _____

Implement the Instructional Plan and Measurement Procedures

Do you check to see that:

- the written instructional plan includes all variables critical to the delivery of the program? _____
- the measurement procedures you specified provide information about the pupils' progress? _____

Modify the Plan Based on Data

If the learner is not progressing toward an objective, do you:

- change the program components and/or _____
- provide additional reinforcers and _____
- monitor the effectiveness of the intervention so new interventions can be made if necessary? _____

Evaluate Overall Progress

Do you have a system for:

- intermittent review of information and skills learned? _____

Bibliography

Initial Assessment

Brouillet, F. B., Frisk, J., Bailey, M. H., & Jackson, F. M. Rules and regulations for the Washington State special education program for children with handicapping conditions As adopted July 27, 1973. Olympia, Washington.

Lovitt, T. C., & Hansen, C. L. Round one -- placing the child in the right reader. Journal of Learning Disabilities, 1975, in press.

Shafto, R. F., & Soltman, S. F. Language Assessment Aid and Scoring Procedure for the Classroom Teacher. Unpublished program, Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington, Seattle, 1976.

Somerton, M. E., & Turner, K. D. Pennsylvania training model. Individual assessment guide. Harrisburg, Pennsylvania: Pennsylvania Department of Education, 1975.

Zeller, R. W. The student progress record: Utilizing student performance data in instructional curricular, district and state level program decisions. Paper presented at the Region I Conference of the American Association on Mental Deficiency, Seattle, Washington, October, 1974.

Objectives

Bateman, B. The essentials of teaching. Sioux Falls, South Dakota: Adapt Press, Inc. 1971.

Mager, R. F. Preparing instructional objectives. Belmont, California: Fearon Publishers, 1962.

Wheeler, A. H., & Fox, W. L. Managing behavior 5: Behavior modification: A teacher's guide to writing instructional objectives. Lawrence, Kansas: H & H Enterprises, Inc. 1972.

Establishing Programs

Bieberly, C. How to do MORE: A manual of basic teaching strategy. Parsons, Kansas: University of Kansas Bureau of Child Research and Parsons State Hospital and Training Center 1974.

Brown, L., Scheureman, N., Cartwright, S., & York, R. The design and implementation of an empirically based instructional program for young severely handicapped students: Toward the rejection of the exclusion principle; Part III. Madison, Wisconsin: Badger Books 1973.

Haring, N. G., & Gentry, N. D. Direct and individualized instructional procedures. In R. Schiefelbusch & N. Haring (Eds.), Teaching special children. New York: McGraw-Hill, 1974.

Krumboltz, J. D., & Krumboltz, H. B. Changing children's behavior. Englewood Cliffs N. J.: Prentice-Hall, Inc., 1972.

McGuigan, C. A. The add-a-word spelling program. Working paper no. 53, Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington, Seattle, 1975.

Panyan, M. C. Managing behavior 4: New ways to teach new skills. Lawrence, Kansas: H & H Enterprises, Inc., 1972.

Tawney, J. W., Allen, M., O'Reilly, C., Cobb, P., & Aeschleman, S. Developing curricula for errorless

Freschi, D. F. Where we are, where we are going, how we're getting there. Teaching Exceptional Children, 1974, 6 (2), 89-97.

Gentry, D., & Haring, N. G. Using probes and daily measurement to insure pupil progress. Unpublished manuscript, Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington, Seattle, 1973.

Lovitt, T. C., Kunzelmann, H. P., Nolen, P. A., & Hulten, W. J. The dimensions of classroom data. Journal of Learning Disabilities, 1968, 1 (12), 710-721.

General

Haring, N. G., & Hayden, A. H. (Eds.) The improvement of instruction. Seattle, Washington: Special Child Publications, 1972.

Jordan, J. B., & Robbins, L. S. (Eds.) Let's try doing something else kind of thing: Behavioral principles and the exceptional child. A report from the Invisiable College Conference on the Application of Behavioral Principles in Exceptional Child Education, March, 1971. Arlington, Virginia: The Council for Exceptional Children, 1972.

Popham, W. J., & Baker, E. L. Systematic instruction. Englewood Cliffs, N. J.: Prentice Hall, 1970.

learning: A search for order in an unorderly world. Paper presented at the First Annual Seminar of Research and Demonstration Centers for Severely Handicapped Children and Youth, Kansas City, Missouri, 1974.

Measurement

Cohen, M. A., Gentry, N. D., Hulten, W. J., & Martin, G. L. Measures of classroom performance. In N. G. Haring & A. H. Hayden (Eds.), The improvement of instruction. Seattle, Washington: Special Child Publications, 1972.

Eaton, M. D., & Lovitt, T. C. Achievement tests vs. direct and daily measurement. In G. Semb (Ed.), Behavior analysis and education. Lawrence, Kansas: University of Kansas Support & Development Center for Follow Through, Department of Human Development, 1972.

Fox, S., & Gentry, D. Charting procedures. Unpublished program, Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington, Seattle, 1972.

Fredericks, H. D., Baldwin, V. L., Grove, D. N., Riggs, C., Furey, V., Moore, W., Jordan, E., Gage, M., Levak, L., Alrick, G., & Wadlow, M. A data based classroom for the moderately and severely handicapped. Monmouth, Oregon: Instructional Development Corporation, 1975.

Johnson, T. S. Precision therapy is the way to go. In J. B. Jordan & L. S. Robbins (Eds.), Let's try doing something else kind of thing: Behavioral principles and the exceptional child. A report from the Invisible College Conference on the Application of Behavioral Principles in Exceptional Child Education, March, 1971. Arlington, Virginia: The Council for Exceptional Children, 1972.

Lovitt, T. C., & Eaton, M. Oh! that this too too solid flesh would melt: Direct and daily measurement hath cometh (The erosion of achievement tests). In N. Bartel & S. Axelrod (Eds.), The handbook for special education research. Council for Exceptional Children, 1974.

Lovitt, T. C. Rationale for measurement. Unpublished paper, Experimental Education Unit. Child Development and Mental Retardation Center, University of Washington, Seattle, 1969.

Interventions

Eaton, M. D., Gentry, N. D., Haring, N. G., & Lovitt, T. C. Applying experimental analysis of behavior to investigating curriculum and making instructional decisions. Paper presented at the Southern California Conference on Behavior Modification, Los Angeles, California, October 1972.

Gentry, N. D. The influence of two teacher education procedures on teacher decision making behavior and pupil performance. Unpublished doctoral dissertation, University of Washington, Seattle, 1974.

Hansen, C. L. Program slicing: A tool for individualizing instruction. Education and Training of the Mentally Retarded, 1973, 8(3), 153-158.

Liberty, K. A. Data decision rules. Working paper no. 20, Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington, Seattle, 1974.

Ongoing Assessment

Airasian, P. W. The role of evaluation in mastery learning. In J. H. Block (Ed.), Mastery learning. New York: Holt, Rinehart, Winston, Inc., 1971.

COMPONENTS OF INSTRUCTIONAL PROGRAMS FOR SEVERELY HANDICAPPED STUDENTS

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Severely handicapped students (Sontag, Burke, & York, 1973) are often different from many "normal" and "mildly handicapped" students on a variety of relevant instructional dimensions (e.g., generalization, retention, imitation, articulation, acquisition, vision skills). Due to such differences the premise offered is that the teacher of these students must systematically delineate, compensate for the absence of, or directly teach skills that teachers of less handicapped students may assume are operative.

For the past several years the writers and their colleagues have been attempting to formulate and implement developmentally tenable and empiracally verifiable educational services for severely handicapped students in the Madison WI, Public School System. One of the vehicles determined of substantial educational value from both training and service perspectives is the organization of circumscribed teacher-pupil interactions into instructional programs. The term instructional program, as it is used here, refers to basic factors, variables, etc., that a teacher of severely handicapped students must consider, systematize, and/or implement in order to teach a particular skill.

Brown and York (1974) delineated a four component model of an instructional program: *What* to teach (content); *how* to teach (method); how does one *assess* whether or not one has taught (measurement); and the instructional *materials* required.

Using the four component model of an instructional program delineated above, severely handicapped students have been taught many developmentally important, practically useful yet circumscribed skills (Brown, Bellamy, & Sontag, 1971; Brown & Sontag, 1972; Brown, Scheuerman, Cartwright & York, 1973; Brown, Williams, & Crowner, 1974). However, as should be obvious, adherence to the four component model may be necessary, but is not sufficient to provide the best possible instructional services in that several crucial factors related to the acquisition and performance of specific skills are not taken into account. Thus, the four component instructional program has been expanded substantially and is presented below:

Basic Components of an Instructional Program

I. *What* skill does a teacher intend for the student to perform (What does a teacher intend to teach the student)?
II. *Why* does a teacher want the student to perform a specific skill?
III. *How* does a teacher intend to teach the student to perform a skill?
IV. How can a teacher *empirically verify* that the skill of concern is being or has been taught?
V. Can the student perform the skill at a situationally acceptable *rate?*
VI. What does a teacher intend to use as *vehicles* (instructional materials) for the skill to be acquired and performed?
VII. Can the student perform the skill across:
    a. *Persons;*
    b. *Places;*
    c. *Instructional materials;*
    d. *Language cues?*
VIII. Can the student perform a skill without directions to do so from persons in authority?

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Before proceeding to a more detailed presentation of each component, several points should be noted and emphasized. First, space does not permit as detailed a presentation of each component as is possible. Second, there is no doubt that the list of components delineated above is incomplete and that additional components will evolve. Third, we are recommending that a teacher of severely handicapped students empirically verify the acceptable status of his/her students on dimensions of at least the components delineated above.

In the narrative that follows, an attempt will be made to elucidate the basic qualities of each component, justify their inclusion, show how they might be realized, and provide teachers with practical suggestions as to how the requisite skills inherent in each might be incorporated into instructional activities.

I. What skill does a teacher intend for the student to perform?

One of the more crucial differences between teaching normal or mildly handicapped students and severely handicapped students is the degree of precision required when presenting instructional content (Brown & York, 1974). Teachers of severely handicapped students must be afforded the experiences and skills necessary to systematically disect, sequence, redisect, resequence, etc., skills under instruction. In our judgment, the conceptual and problem attack skills required and fostered by a task analysis orientation are ideally suited for teachers of severely handicapped students.

A teacher may be interested in teaching a value, an appreciation, an attitude, a skill, a concept, an understanding, a subtlety, or a feeling. Certainly, such initially nebulous objectives can be taught to severely handicapped students. However, the position offered here is that such objectives probably can be realized more efficiently if they can be operationalized in such a manner as to clearly indicate to the teacher and to the student precisely what is requested and when it should be manifested. It is a rare severly handicapped student indeed who can make large leaps through poorly organized and unspecific curriculum content. On the other hand it has been our experience that all students can acquire new skills if those skills are disected and sequenced precisely.

Task analysis essentially requires the precise delineation of skills within a particular curriculum area, the division of those skills into component parts, and the sequencing of those skills from easy to hard (simple to complex). According to Resnick, Wang and Kaplan (1974) task analysis involves:

> the develop(ment of) hierarchies of learning objectives such that mastery of objectives lower in the hierarchy (simpler tasks) facilitates learning of higher objectives (more complex tasks) . . .
>
> This involves a process of task analysis in which specific behavioral components are identified and prerequisites for each of these determined (p. 680).

Perhaps the major purpose of analyzing skills inherent in a curriculum content area is to delineate an organized and precisely stated constellation of verifiable objectives from which a variety of instructional activities can be generated. A task analysis is not a statement of how a skill is to be taught but rather a statement of what is to be taught. A precise delineation of what is to be taught is an obvious prerequisite to the determination of the required materials, teaching procedures measurement procedures, etc.

Notions as to what skills should be included in a particular content area and how such skills might be analyzed and sequenced can be obtained or abstracted from at least the following:

a. general child development literature,
b. general cognitive development literature,
c. general special education literature,
d. commercially available curriculum packages,
e. logical post-school performance demands.

It has been our experience that teachers of severely handicapped students can rarely use, without substantial adaptation, commercially available instructional content. Thus, from a training perspective, perhaps it is more appropriate to provide a teacher with skills and experiences in the area of task analysis so that in subsequent practical situations that teacher can adapt other or create new analyses

to fit the developmental functioning level of his/her students.

There are at least three major reasons why teachers of severely handicapped students should be skilled in the use of basic principles of task analysis. First, a task analysis delineates starting points and terminal objectives and enhances the possibility that essential component skills will not be neglected. Second, utilization of task analysis procedures facilitates instruction that is tailored to individual functioning levels. For example, within the task analysis model, mastery of various objectives can be assessed before instruction, and students may only be instructed on objectives on which they failed to reach and for which they have mastered the prerequisites. In addition, students can be permitted to proceed through the sequence at their own pace, taking longer on trouble spots and skipping objectives on which they demonstrate mastery. Third, the utilization of task analysis procedures facilitates the development of more effective and efficient classroom programming. That is, a teacher can obtain data from students concerning the order in which skills are most readily acquired and skills that must be broken into smaller subskills in order to facilitate acquisition. This information can be used to continually improve instructional programs.

II. Why does a teacher want the student to perform a specific skill?

Generally, longitudinal educational objectives for severely handicapped students should be no different than those for other students. Public schools should prepare severely handicapped students to function as independently as possible socially, vocationally, and personally in the least restricting post school environment. In our view, there is no justification for preparing students to function in large residential institutions or to foster or maintain the development of environments that unduly shelter, restrict, or retard.

Perhaps due to the limited educational opportunities in the past and the almost inevitable placement of severely handicapped citizens in large residential institutions, it might have been acceptable to teach them to "walk in line," "make pot holders," "watch Jack LaLane" without much concern for *why* such skills were taught. Now, however, severely handicapped students will be enrolled in public school programs for as long as 21 years. Longitudinal public education coupled with the goals of the deinstitutionalization and child advocacy movements force us to ask and justify *why* we should teach any specific skill. It is our current view that instruction of a skill should be justified primarily as a cumulative segment of a developmentally sound longitudinal curriculum sequence which is designed to insure independent functioning.

Well defined skill sequences across curricula domains (e.g., math, reading, language, play, self-help, independent community functioning) may be utilized to precisely delineate functioning levels within each domain. Placement of an individual along dimensions within skill sequences provides the teacher with vital information concerning the skills the individual has mastered, those that remain untaught, and in what order they might be presented. In addition, utilization of developmental skill sequences might minimize the potentially deleterious effects of changes in teachers and administrators on longitudinal programming. Obviously, a precise delineation of the current functioning level of a student on a variety of educationally important dimensions is more relevant to the development of viable instructional services than the use of such descriptions as autistic, severely retarded, trainable, psychotic, emotionally disturbed, and low MA.

Finally, while the provision of longitudinal developmental services is a goal to which we all must strive, we have an extremely long way to go before realization. There are persons around the country who have developed relatively good preschool or postschool programs, others have developed reasonable public school age programs, others have developed notable parent training activities others have potentially valuable research projects in operation, etc. To our knowledge there is no place in which all the needed longitudinal service components are operating to such an extent that the development of large numbers of citizens over long periods of time is maximized. Certainly, we still need to develop isolated bits of information, certainly extraordinary case study achievements will continue to be inspirational; but these and other such delimited endeavors rarely provide substantial changes in the life styles of many severely handicapped citizens.

III. How does a teacher intend to teach the student to perform a skill?

There is no doubt that teachers can formulate logically defensible longitudinal curriculum sequences and ingenious clusters of apparently relevant task analyses. However, if a teacher cannot teach students to perform the skills required by the sequences and analyses, then all is for naught. The procedures, techniques, tactics, strategies, etc. teachers use to reach new skills may be referred to as the *how* of instruction. Without a technology of *how; what* to teach is rhetoric.

Arriving at an empirically tenable system of *how* to teach new skills to severely handicapped students is one of the most crucial challenges confronting the educator. Particularly since delineating an appropriate *how* to teach is almost always confounded with varying degrees of visual, auditory, motor, attending, etc. impairments.

Precise and replicable statements as to how to teach new skills are unfortunately quite rare. What may be an effective procedure for teaching one student or one group of students may be inappropriate for another student or group. In addition, even such apparently precise techniques as those generated from the operant conditioning laboratories under the rubric of behavior modification and discrimination training are probably arts (Bricker, 1970).

Statements as to *how* to teach severely handicapped students have emanated from and will continue to emanate from many sources: electrical and mechanical engineering, human development, special education, psychology, teacher and parent ingenuity, the history of education, what grandmothers once did to name but a few. In an attempt to be eclectic and practical and still be relevant to the problems of severely handicapped students, we have organized information from a variety of sources into what may be referred to as basic principles of acquisition and performance. Many of the terms used to describe these principles have been taken from literature related to operant and respondent conditioning, discrimination learning, concept development and imitation learning. However, it should be emphasized that these principles, techniques, tactics etc. must be adapted or converted for classroom use; that many schools of thought describe the same event with different words; and that the principles available for systematic utilization now are not sufficient for the educational community to provide the best possible services.[2]

IV. How can a teacher empirically verify that the skill of concern is being or has been, taught?

Some teachers do not even attempt to systematically assess any aspect of student progress; some teachers attempt to record every response every student makes every minute the students are in school; some teachers use one particular measurement system to the exclusion of all others. The position offered here is that teachers should have the skills necessary to implement a variety of measurement designs and techniques in such a manner as to foster a smoothly flowing instructional environment, yet in a manner that also allows the systematic recording and empirical verification of crucial aspects of student development.

There can be little doubt that *direct* measurement of the developmental progress of severely handicapped students is a vital aspect of any instructional system. Perhaps the following two passages are appropriate here:

> In any empirical definition of teaching, instructional measurement is crucial. With normal and mildly handicapped students, inferences about populations of skills made from samples and inferences about generalization of skills across persons and places and materials are probably necessary and tenable. Unfortunately, inferential measurement, in our judgment, is an extremely questionable measurement orientation when applied to most severely handicapped students. The general rule that we try to follow may be stated as follows: If you determine that a particular response, skill, concept, etc., is important to the development of the student, then it is incumbent upon the teacher to *directly* measure the existence of the response, skill, concept, etc. of concern (Brown and York, 1974, p. 9).

[2] *A more detailed listing of basic principles of acquisition and performance and appropriate references are available upon request.*

> Direct measurement is particularly crucial in attempts to teach cumulative tasks. If the correct performance of the responses in component C of a task are for (SIC) dependent upon the correct performance of the responses in components A and B, then the teacher must guarantee that A and B responses are in the behavioral repertoire of the student before she even considers progression to component C. Since most developmental skills are in many ways cumulative (mathematics, reading, language, speech, practical arts), teachers of trainable-level retarded students must be prepared to spend relatively lor periods of time and considerable effort developing basic behavioral repertoires (Brown, 73, p. 110-111).

It should be noted and emphasized that in addition to competencies related to *how* to empirically verify (measure) student progress, teachers should also be exposed to rationales regarding why and when to measure and to a variety of approaches toward measurement.

The following is a selected listing of measurement issues, terms, designs assumptions tactics. etc. to which our teachers in training are exposed. It should be noted that most of the designs listed below are what may be referred to as "subjects as their own controls designs." However, in addition to the listings below, teachers in training, as part of their general preparation, also receive information regarding parametric and nonparametric statistical manipulations, intergroup designs, standardized tests, etc.[3]

Basic Principles of Instructional Measurement

1. Subjective - Objective
2. Dependent Variable
3. Independent Variable
4. Intra-group Measurement Designs
5. Inter-group Measurement Designs
6. Correlated Designs (AB Design)
7. ABAB Designs
8. Test-Teach-Test Designs
9. Multiple Baseline Designs
10. Trials to Criterion Designs
11. Direct Measurement
12. Inferential Statistics
13. Cumulative Review Designs
14. Reliability
15. Correlation
16. Criterion Referenced Tests
17. Rate of Response
18. Intensity of Response
19. Frequency of a Response
20. Latency of a Response
21. Duration of a Response
22. Errors to Criterion
23. Population
24. Continuous Measurement
25. Parameter
26. Sample
27. Statistic
28. Probe Designs

V. Can the student perform a skill at a situationally acceptable rate?

Rate is a term which typically refers to the number of times a particular response occurs in a given time period. In an academic setting where often times a skill is a composite of different responses, the view of rate can be extended to include the number of times all critical components of a skill are performed in a given time period. There is no doubt that severely handicapped students have deficiencies in the rates at which they perform particular responses or clusters of responses. There are times when severely handicapped students manifest rates of responding that are too high. For example, a normal student might hit himself in the head once a week, a severely handicapped student might hit himself in the head five times per minute for months. A somewhat similar but different rate deficiency also manifested is the inordinate amount of time many students require to progress through a series of cumulative responses. If students have acquired a skill and performed it correctly a specified number of times, it does not necessarily indicate that the skill is mastered. In order for a skill to be considered mastered, that skill should be performed correctly at a relevant rate criterion (proficiency).

There are at least three reasons for including rate of correct responding as a component of skill mastery. First, if students are to compete with and be tolerated by other individuals in the

[3] *A more complete listing and appropriate references are available upon request.*

community, they will have to perform skills at community acceptable rates. For example, assume that a student has been taught to make change and then the student is asked to go to a grocery store and purchase the items on a grocery list. In a situation that actually occurred, one of our students secured the items on the list, computed the total cost of the items, and then counted out the appropriate amount of money required to pay for the goods. Unfortunately, the counting of the money required almost *five* minutes. Thus, a situation can exist where a student could accurately perform a given series of responses, but the time required for the performance may not be acceptable in a community setting.

Second, if a skill requires the utilization of a number of responses in sequence, a slow rate of responding may interfere with the performance of all components in the sequence by increasing the probability that the student may be unable to recall certain components. For example, assume a teacher gives a student a three component direction to follow. If the student takes twenty minutes to perform the first response, there is a good chance that she/he may not remember the cues for the last two responses.

Third, if one accepts the premise that a skill should be not only performed correctly, but performed at an acceptable rate criterion, then a question remains regarding *when* a rate criterion should be imposed upon skills that are cumulative. Because of a paucity of research in the application of a rate criterion in educational settings, a teacher faced with this question seems to have two major options. Assuming skills A, B and C are cumulative, a teacher may choose to require the student to: perform A at a proficient rate before moving on to B; next perform both A and B (i.e., in combination) at a proficient rate before moving on to C; and finally, perform A, B and C at a proficient rate before terminating instruction. A second option would be to require the student to perform A, B and C correctly. Once acquired, a rate criterion would be imposed upon the combined skill (A, B and C) in order to achieve an acceptable level of proficiency.

VI. What does the teacher intend to use as vehicles for the skill to be acquired and performed?

Tasks and task materials are vehicles through which skills are taught. Obviously, choosing tasks and task materials should not be a hastily made arbitrary decision. Teachers should carefully design and/or choose tasks and materials that reflect a consideration of the unique problems presented by the students of concern. Since one of the primary goals of teaching severely handicapped students is to verify that skills acquired in controlled instructional settings will be performed in other more practical environmental settings, many tasks should be chosen for their functional use across environments.

Functional tasks can serve the dual purposes of providing concrete examples of abstract concepts which may increase meaningfulness (Zeaman, 1973) and of teaching practical skills that students may be able to utilize daily across many environments. For example, one-to-one correspondence skills (aligning members of two sets in an arrangement which manifests a one-to-one relationship between the members) may be taught through the aligning of blocks and bears, putting straws in cups, giving each classmate a cookie, or giving each place setting a cup, plate, spoon and fork when preparing for lunch. The latter two examples teach the skill while stressing function in applied settings; the former two simply require performance of the skill. The meaningfulness and utility that functional tasks can add to the acquisition of the skill argue strongly for their use when designing instructional programs.

Not all skills can be taught exclusively through functional tasks and materials. The types of tasks needed to teach many visual discriminations to severely handicapped students highlight this point. When teaching a visual discrimination skill the task chosen should make the essential stimulus characteristics (e.g., form, color, size) easy to discern. Although this point appears simple to apply, it has ramifications which, if not considered when structuring tasks, unfortunately may lead to the development of differential responding to nonessential stimulus characteristics. For example, assume a teacher wants to teach a student to discriminate the letter "A" from the letter "B." In an attempt to make the differences between the two letters easy to discern, the teacher presents a red uppercase "A" and a blue uppercase "B." In this situation the teacher may find that the student has learned that red is called "A" and blue is called "B."

A fundamental discrimination learning rule related to selecting tasks with which to teach concepts is to choose tasks which will insure that responding is controlled only by the essential

characteristics of the concept. In the letter recognition discrimination task mentioned above, this rule requires that the task should be designed so that responding is controlled by the form of the letters, not by color, size, texture or spatial position, etc. When using a functional task, control over nonessential or irrelevant characteristics is often difficult to achieve. For example, if one of the tasks used to teach letter discrimination is labelling the letters in the words "men" and "women" as they appear on the doors of public restrooms, a multiplicity of scripts, colors and placements would probably be encountered which might impede acquisition of the skill. In such situations, nonfunctional tasks which make the essential stimulus characteristics easy to discern and concommitantly reduce nonessential stimulus characteristics should probably be employed initially. Once the skill is acquired, however, essential and nonessential stimulus dimensions could then be varied or introduced.

When relating to this issue Becker, Engelmann and Thomas (1971) suggest that to insure that essential stimulus characteristics control responding, instructional tasks should be chosen which allow the teacher to:

1. teach a concept through a set of "instances" and "not instances" of the concept (e.g. examples of the letter "A" and examples that are not of the letter "A"),

2. construct "instances" of a concept such that they all have essential concept characteristics, and construct "not instances" having none or only some of the essential characteristics.
3. frequently vary nonessential characteristics of "instances" and "not instances" to insure that responding is only to essential characteristics (e.g., when teaching the letter "A", the size, color, texture and position of "instances" and "not instances" of the letter should be varied).

Implicit in the above three suggestions is the assumption that students are attending to variations in essential and nonessential characteristics of the stimuli presented. Often it is not enough to simply *expect* that consistent manipulation of the stimulu will be both necessary and sufficient conditions to produce the differential responses of concern. In some instances having students verbally label stimulus dimensions (nonverbal students might use gestures) and stimulus choices may facilitate differential responding to essential stimulus characteristics, and also increase retention of correct responses through the development of mediators (Butterfield, Wambold, & Belmont 1973; Borkowski & Wanschura, 1974; Bricker, 1972; Jeffrey, 1953; Jeffrey, 1958; Chatelanat, Henderson, Robinson, & Bricker, 1971; Zeaman, 1973; Zimmerman & Rosenthal, 1974).

Other situations in which a teacher might choose to supplement functional with nonfunctional tasks might be those that require repeated practice for the acquisition of a skill, since many functional tasks typically permit only one or two response opportunities for only a few students per day. It is probably not efficient though to simply employ a task because it permits repeated practice of a particular skill in that boredom and inattention which can compete with academic progress are many times end products of stereotypic repetition.

Whether a task is functional or not, teachers should attempt to utilize tasks and materials that have reinforcement value. Choosing tasks on the basis of their reinforcement value involves selecting tasks and materials with which students will readily interact, preferably in free play situations. (A free play situation is referred to here as one where the task is available, but the student is neither prompted to engage in it nor externally reinforced for engagements.) On many occasions teaching skills through tasks with reinforcement value may involve teaching skills through toys, games, music and songs (e.g., sight words may be taught through potentially dull flashcard drills or through potentially more interesting sight word games).

If it is necessary to teach skills for which few functional tasks can be readily devised, then games, toys, music and songs which require the performance of the skills may enable the teacher to add an intrinsically reinforcing functional component while at the same time increasing the probability that maintenance through repeated practice in other environmental settings will occur after instruction. That is, games, toys, music and songs which require the performance of skills may be used to augment academic programming and as recreational activities to provide additional practice of skills in a variety of environmental settings.

Some criteria for selecting potentially reinforcing tasks are: a) tasks should be novel or offer results that are not always predictable; b) tasks should be matched to functioning levels. Tasks which are either too easy or too sophisticated are not appropriate. However, tasks just above current functioning level should hold interest and pace development; and c) tasks should allow active engagement and manifest cause and effect relationships (Piaget, 1952).

There are at least three major advantages to teaching skills through tasks with reinforcement value: 1) skills may be reinforced by allowing continued performance of the task and/or interaction with the task materials instead of relying upon teacher delineated reinforcers; 2) students are more likely to interact with the task materials and thus perform the skills taught through them outside controlled instructional situations; and 3) there should be an increased probability that students will visually and/or aurally attend to intrinsically reinforcing tasks and task materials, thus possibly eliminating the need to systematically teach attending - a necessary prerequisite to most teaching situations.

There are two additional factors which should be considered when delimiting the types and characteristics of functional tasks. First, a task that may initially appear functional may not actually be so for particular students who live in environments where there are few or no opportunities to perform related skills. Setting a table is a functional task through which one-to-one correspondence skills can be taught. However, if students live in an environment where they are not and may never be required to set a table, the task will not have functional value. Thus, teachers should attempt to insure that tasks are chosen that adequately represent the options that students have available in the environment in which they live or might live in the future. Second, tasks should be chosen on the basis of their facilitation of later skill development. This involves teaching tasks that will become components of higher level skills in a developmental sequence. Teaching students to count fingers as a rational counting task may not have much utility when rational counting is taught, but should have great utility when addition is taught.

In summary, when a teacher is considering what to use as vehicles for skills to be acquired and performed by severely handicapped students, tasks and task materials should be chosen on at least the basis of their: a) functional use to the individual student; b) ease of discrimination; c) accessibility to repeated practice; d) reinforcement value; e) facilitation of skill maintenance; f) accessibility or frequency of occurrence across settings the individual inhabits; and g) facilitation of later skill development. As it is unlikely that many tasks will fulfill all the criteria delineated, it is often necessary to teach a skill through many different tasks and materials.

VII. Can the student perform the skill across persons, places, instructional materials and language cues?

A stimulus generalization paradigm may be used to conceptualize selected aspects of severely handicapped students' failure to perform skills acquired in one teaching environment in other environmental configurations.[4] The summarization of laboratory research studies concerned with stimulus generalization contained in Mostofsky (1965) suggests that a given response must be taught with the teaching environment in a specified state or configuration. After a response has been taught, variations in some well controlled aspect of the initial teaching environment can be introduced and the presence of the response in the new environmental configuration can be measured. Research findings related to stimulus generalization suggest that if *dramatic* departures from the initial teaching environment are arranged, performance in the changed environment will probably be substantially different from performance in the initial teaching environment. However, if the changed environment is only *slightly* different from the initial teaching environment, performance in the changed environment will probably differ slightly if at all from performance in the initial teaching environment.

The graduation of responding observed when the performance of a response is assessed in environmental configurations slightly or dramatically different from the configuration in which the

[4] *As used here environmental configurations include language cues, persons, places and instructional materials.*

original instruction took place is known as a generalization gradient. Sidman (1960) states that, "The generalization gradient provides a mechanism whereby behavior can adapt to an environment that never exactly repeats any combination of 'stimuli.' If a successful form of behavior were to come under the control of the precise circumstances that were present at the time it was acquired, we should have to relearn the behavior each time the original situation reoccurred with its inevitable variations (p. 207)." In the following paragraphs attempts will be made to describe how a stimulus generalization paradigm may be used to conceptualize generalization across instructional materials extraneous stimuli and relevant cues to respond.

Performance Across Instructional Materials

Assume that a severely handicapped student in a public school classroom has been taught to touch a ball when the teacher presents a small *dark* blue ball, a small dark blue cup and the verbal language cue, "Touch the ball." If the teacher then dramatically changes the task by presenting a large brown medicine ball three feet in diameter, a small dark blue cup and the language cue, "Touch the ball," it is relatively unlikely that the student will manifest better than a chance level of correct responding. However, if the teacher only slightly changes the initial instructional materials by presenting a small *light* blue ball, a small dark blue cup and the verbal language cue, "Touch the ball " it is likely that the student will consistently respond correctly to the new instructional material. To summarize, if dimensions of instructional materials are changed slightly, students tend to maintain responding or generalize across materials. On the other hand, if stimulus dimensions are changed dramatically, students tend to respond differentially or discriminate.

Performance Across Extraneous Stimuli

Extraneous stimuli, as the phrase is used here, are stimuli in the environment which are not intended to control a specified response. That is, touching a ball in response to a verbal language cue should not be a function of the size of the room, the color of the teacher's hair, the chair in which a student sits or the position of the objects on the table. However, it is possible that some extraneous features of an initial teaching environment can acquire response controlling properties If a teacher does not allow for such a possibility, she may mistakenly conject that failure to perform across environmental configurations is solely a function of, for example, the student not attending to the form cues of the ball and the cup referred to above. In fact, however, failure to perform may be a function of dramatic changes in the chair, the table, the room, the color of the teacher's hair, or the position of the objects on the table.

Performance Across Relevant Cues to Respond

A relevant cue to respond is referred to here as a stimulus or stimulus cluster which is intended to control the response a student is to perform. In a classroom for severely handicapped students cues to respond are usually presented by a teacher or contained in instructional materials. However, such stimuli as school bells and the time on clocks also function as cues to respond.

Cues to respond typically have at least a verb component which indicates the action the student is to perform (e.g., touch, take, give, pick up) and a noun component which indicates the object of the action (e.g., touch the *ball,* pick up the *paper*). Cues to respond which have action and object components do not have to be verbal in nature: a stare by a teacher may be a cue for the student to "Sit down on a chair;" a deaf educator may use hand signals to cue a student to "Touch a ball." These cues are nonverbal but nevertheless contain action and object components. In addition, it should be noted that slight variations in the physical topography of nonverbal cues to respond may not result in differential performance. However, it is likely that dramatic variations in nonverbal cues to respond *will* result in differential performance. Concommitantly, when the cue to respond is verbal, slight variations in the way words are articulated will probably affect performance minimally, while dramatic articulation changes will probably affect performance significantly.

In a stimulus generalization paradigm a student is required to make topographically similar responses despite variations in dimensions of the instructional materials and extraneous stimulus constellations. Performance across different verbal language cues certainly may be conceptualized within the framework of a stimulus generalization paradigm. However, performance across different

verbal language cues requires additional discrimination training to generate differential performance to the different verbal language cues.

More specifically, a teacher can issue a series of different verbal language cues to respond and the appropriate responses to the different language cues could be topographically *dissimilar*. For example, a teacher could present the student with a *slightly different* colored ball and cup on each trial and rotate the cues, "Give me the ball;" "Touch the ball;" "Point to the ball;" and "Take the ball." The student would have to respond in a topographically dissimilar way to each different verbal language cue in order to respond correctly. In this situation the stimulus generalization paradigm applies in that dimensions of the instructional materials were varied such that the student was required to respond to a slightly different instructional material on each presentation of the noun component of the verbal language cues. However, in order for the student to respond correctly it was also necessary for the student to *discriminate* the different *verb* components of the various response cues and differentially respond to those cues.

In addition, however, a teacher can issue a series of different verbal language cues to respond and the appropriate responses across the different language cues could be topographically similar. For example, a teacher could say, "Pick up many," or "Pick up several," or "Pick up a lot " or "Pick up a bunch," and the student could respond similarly and correctly to all the different language cues.

Obviously, certain verbal language cues may present unique problems when attempting to teach a student to perform a skill across environmental configurations because the student may be required to respond differentially to components of the cues. For instance, assume that in an initial teaching environment a teacher taught 'Tom' to touch the ball when presented with a small blue ball and a cup; a large red ball and a pillow; a small brown ball and a potato, etc. and then proudly announces to Tom's mother that he now can indicate what a ball is when given a verbal language cue. That night, Tom's mother places a small blue ball and a cup in front of Tom and says, "Give me the ball" and Tom fails to give the ball to his mother. If it can be assumed that Tom did not fail due to changes in the instructional materials or because he responded to extraneous stimuli in the home environment, the reason for failure may be due to the change in the verbal language cues used. If the reasons Tom failed are related to the verbal language cue used by his mother, then at least two hypotheses seem tenable. First, Tom may not have responded differentially and independently to the specific verb and noun components of the language cues in the school and home environments. That is, he may have responded to only the noun components of the language cues and therefore did not differentially respond to the different verb components. Second, Tom may have responded differentially and independently to the specific verb and noun components of the verbal language cues but did not know what action to perform to the "Give" component.

The implication for educational programming is that to teach a student to perform a skill across environmental configurations the student must be taught to appropriately respond to common variations in verbal language cues, extraneous stimuli, and task materials that frequently occur across environmental configurations.

If the success of a program is to be assessed in terms of student performance of skills across environmental configurations, then the objective for each major skill taught in a program should include student performance of skills across such selected environments. For example, the instructional objective for a one-to-one correspondence skill might be: Given the language cues, "Give each_____a _____," "Give every_____a _____," or "Put a_____ in each_____" by at least three different control figures (e.g., teacher, mother, peer) across at least three settings (e.g. classroom, playground, home) and across at least three functional tasks (e.g., setting the table, passing out cookies, dealing cards) the student should perform the skill.

Potentially, there are many instructional strategies which could be employed to insure that students master objectives. Perhaps the following strategy may be reasonably effective. If students are to perform the skills across functional tasks, then teach the skill through a combination of functional tasks and nonfunctional tasks which fulfill the task selection requirements previously delineated. For instance, teach the students one-to-one correspondence through such tasks as passing out juice cups and giving each bear a block. If the students are to perform the skills across settings then it may be advantageous to teach the skills in several settings. For instance, teaching might occur in the gym, on the playground, in the hall, in the bathroom, and in a kitchen area using tasks appropriate to those

areas. If it is necessary that students perform skills under the direction of several control figures, then several control figures may be used in instruction. If the students will likely encounter varied language cues to respond, then instruction should include cues to respond which frequently occur

Many educators evaluate instructional program efficacy in terms of how quickly students advance through the steps of a task analysis or curriculum sequence. However, efficacy should also be assessed in terms of whether the students can perform skills across persons, places, instructional materials and language cues. Insuring that students can perform skills across environmental configurations in many instances may slow the students' advancement through the steps of a curriculum sequence. To account for this, educators will have to incorporate measures of both rate of advancement through a curriculum sequence and performance of skills across environmental configurations into their evaluation of program efficacy.

VIII. Can a student perform a skill without directions to do so from persons in authority?

Individuals labeled severely handicapped are often referred to as externally controlled. That is, persons in authority usually tell them what skills to perform; how and when to perform the skills; if they perform the skills correctly or incorrectly; if they perform the skills incorrectly how to rectify the errors, etc. While responding appropriately to specific cues provided by persons in authority is the responsibility of all adults, there are situations in which performance is crucial but in which persons in authority are not present. In such situations it appears that severely handicapped students are particularly deficient and therefore quite vulnerable. One way to compensate for such a deficit is to teach specific skills, and then insure that those skills can be performed appropriately across environmental configurations *without* specific verbal cues being provided by persons in authority. Perhaps the following will elucidate.

There are situations in which it is appropriate for individuals to make a specific response to a specific cue provided by a person in authority (e.g., following a list of verbal directions; recording the food order of a customer in a restaurant). There is little doubt that severely handicapped students can acquire such skills and that such skills have enormous functional value. However, in these situations persons in authority are continuously providing the relevant cues to respond. Obviously, such cue-response relationships are appropriate in some situations, but extremely inappropriate in others in that extraordinary dependence upon the cues of others in authority is fostered, and persons in authority are in effect determining all responses.

There are also situations in which it is appropriate for individuals to make a *series* of responses to only one cue provided by a person in authority (e.g., "Change the tire;" "Make the salad;" "Start working;" "Clean the tables"). Again, there is little doubt that severely handicapped students can acquire such skills and that such skills also have enormous functional value. However, here also persons in authority are providing at least the initial cues to respond and the problems delineated above may be attendant.

Undoubtedly there are thousands of situations in adulthood which require responding specifically to verbal or other cues provided by persons in authority. However, there are also situations which require that adults engage in a response or series of responses *in the absence* of cues to respond provided by persons in authority (e.g., when a person sees a burning sofa; when a person is alone and cuts a finger; when a person is lonely or lost; when shopping for food or clothing). If an individual responds appropriately when persons in authority are not providing specific cues to respond, that individual may be construed as manifesting self-initiated performance skills. Obviously self-initiated performance skills are crucial to the independent functioning of severely handicapped students.

Finally, there are situations which require that a person engage in a series of responses evaluate the correctness of the responses, and, if necessary, correct mistakes without being verbally cued by an authority figure. For example, if a person is confronted with a burning sofa, he/she might smother it with a throw rug, check to see if it is still smoking, and if necessary, pour water on it.

It has been our experience that many classroom activities designed for severely handicapped students have not included manipulations that allowed the students to: a) perform skills in the absence of cues provided by persons in authority; and b) evaluate and, if necessary, correct errors.

Thus, we are suggesting here that teachers determine if it is appropriate for a particular skill to be

performed without specific cues to do so provided by persons in authority. If so, teachers should arrange for such performance. In addition, if it is appropriate that a student perform a series of responses, evaluate the responses, and if necessary, correct errors, then teachers should also arrange for such performance.

In the recent past the writers and their colleagues have made attempts to teach severely handicapped students the skills necessary to initiate responses or a series of responses to evaluate the correctness of the responses made, and if necessary, to correct errors with few if any cues provided by persons in authority. Such skills are referred to here as self-regulation skills. Nietupski and Williams (1974) conceived of rudimentary self-regulations skills as consisting of at least four basic steps:

1. Detecting or defining the task.
2. Arriving at alternative ways to complete the task.
3. Implementing an alternative.
4. Assessing the outcome of the alternative:
   - if the task is not correctly completed. → (return to step 2)
   - if the task is correctly completed, task ends.

In the Nietupski and Williams (1974) paradigm students may fail to self-regulate responding because: a) they do not self-initiate steps in the self-regulation strategy; b) they fail to detect or define the task; c) they fail to arrive at an appropriate way to complete the task; d) they fail to implement an appropriate alternative; or e) they fail to evaluate the outcome correctly.

It is suggested here that self-regulation may be incorporated into a curriculum for severely handicapped students as follows: When a skill is taught, if practical, the students should be required to initiate all components of the self-regulation strategy to complete tasks related to that skill without verbal cueing from persons in authority. For example, if students are acquiring skills related to cooking, they should be required to initiate the preparation of their own meals without verbal cueing from authority figures. Stated another way, whenever a new skill is taught the students should be required to complete tasks related to the skill, generate alternative ways of completing the task, implement an alternative, and check the appropriateness of the alternative implemented.

Self-regulation strategies should not be taught as segmented or isolated curriculum entities but as integral parts of all activities in which students participate.

Hopefully, if educators in conjunction with parents and other concerned persons can teach students to perform situationally appropriate skills without specific direction to do so, we will more closely approximate the longitudinal objective of independent adult functioning.

Summary

Several basic components of instructional programs for severely handicapped students were delineated and described. Obviously, each component is in need of further elaboration and refinement and methods of incorporating them into longitudinal curriculum sequences must be operationalized. The possibility exists that adherence to *all* components when attempting to teach *all* skills might be impractical and irrelevant. However, it has been our unfortunate experience to observe students fail because we did not systematically consider and accommodate to relevant instructional variables. Perhaps if teachers absorb at least the components delineated into their educational services, the general skill repertoires of the students in their charge will be enhanced substantially.

In addition, it should be noted and emphasized that there is no doubt that the version of an instructional program offered here will evolve into a different form in the future. Some components will probably be rejected, some will be expanded, and others will be added. Hopefully, what happens to this version will be a function of increased awareness of the students we are attempting to serve.

Finally, teaching technologies and other information related to the provision of the best possible educational services to severely handicapped students are in the initial stages of development. On the

other hand, educators throughout the nation are being asked, ordered, or voluntarily striving to provide educational services to such students. When such an information/service gap exists, frustrations and failures are inevitable. Hopefully, through the collective efforts of many persons from many orientations and disciplines we will be able to demonstrate in the near future that comprehensive, longitudinal, and quality educational services can be generated and those services will result in substantial developmental changes in the functioning levels and ultimate life styles of citizens who at least for the moment, are referred to as severely handicapped.[5]

[5]*The reader interested in securing information concerning the materials, references, curriculum sequences, etc. referred to in this paper is encouraged to write Dr. Lou Brown, 427 Education Building, University of Wisconsin, Madison, Wisconsin 53706. Some materials will be sent free of charge. If there is a charge, the reader will be referred to the appropriate vendor.*

References

Becker, W., Engelmann, S., & Thomas, D. Teaching: A course in applied psychology. Chicago: Science Research Associates, Inc., 1971.

Borkowski, J., & Wanschura, P. Mediational processes in the retarded. In N. Ellis (Ed.), International review of research in mental retardation. Vol. 7. New York: Academic Press 1974.

Bricker, D. Imitation sign training as a facilitator of word-object association with low-functioning children. American Journal of Mental Deficiency, 1972, 76, 509-516.

Bricker, W. Indentifying and modifying behavioral deficits. American Journal of Mental Deficiency, 1970, 75 (1), 16-21.

Brown, L. Instructional programs for trainable-level retarded students. In L. Mann & D. A. Sabatino (Eds.), The first review of special education. Vol. 2. Philadelphia: Journal of Special Education Press, 1973.

Brown, L., Bellamy, T., & Sontag, E. The development and implementation of a public school prevocational training program for trainable level retarded and severely emotionally disturbed students. Vol. I. Madison, Wisconsin: Madison Public Schools, 1971.

Brown, L., Scheuerman, N., Cartwright, S., & York, R. The design and implementation of an empirically based instructional program for severely handicapped students: Toward the rejection of the exclusion principle. Vol. III. Madison, Wisconsin: Madison Public Schools, 1973.

Brown, L. & Sontag, E. Toward the development and implementation of an empirically based public school program for trainable mentally retarded and severely emotionally disturbed students. Vol. II. Madison, Wisconsin: Madison Public Schools, 1972.

Brown, L., Williams, N., & Crowner, T. A collection of papers and programs related to public school services for severely handicapped students. Vol. IV. Madison, Wisconsin: Madison Public Schools, 1974.

Brown, L. & York, R. Developing programs for severely handicapped students: Teacher training and classroom instruction. Focus on Exceptional Children, 1974, 6 (2).

Butterfield, E., Wambold, C., & Belmont, J. On the theory and practice of improving short-term memory. American Journal of Mental Deficiency, 1973, 77 (5), 654-660.

Chatelanat, G., Henderson, C., Robinson, C., & Bricker, W. Early classification skills of developmentally delayed toddlers. In D. Bricker and W. Bricker (Eds.), Toddler Research and Intervention Project Report: Year I. IMRID Behavioral Science Monograph No. 20, Institute on Mental Retardation and Intellectual Development, George Peabody College, Nashville, Tennessee, 1971.

Jeffrey, W. The effects of verbal and nonverbal responses in mediating an instrumental act. Journal of Experimental Psychology, 1953, 45, 327-333.

Jeffrey, W. Variables in early discrimination learning: I. Motor responses in the training of a left-right discrimination. Child Development, 1958, 19, 269-275.

Mostofsky, D. (Ed.), Stimulus generalization. Stanford, California: Stanford University Press, 1965.

Nietupski, J. & Williams, W. Teaching severely handicapped students to use the telephone to initiate selected recreational activities and to respond to telephone requests to engage in selected recreational activities. In L. Brown, W. Williams, and T. Crowner (Eds.), A collection of papers and programs related to public school services for severely handicapped students Vol. IV. Madison, Wisconsin: Madison Public Schools, August, 1974. 507-560.

Piaget, J. The origins of intelligence in children. New York: Humanities, 1952.

Resnick, L., Wang, M., & Kaplan, J. Task analysis in curriculum design: A hierarchically sequenced introductory mathematics curriculum. Journal of Applied Behavior Analysis, 1973, 6 (4), 679-710.

Sidman, M. Tactics of scientific research. New York: Basic Books, Inc., 1960.

Sontag, E., Burke, P., & York, R. Considerations for serving the severely handicapped in the public schools. Education and Training of the Mentally Retarded, April, 1973, 8 (2).

Zeaman, D. One programmatic approach to retardation. In D. Routh (Ed.), The experimental psychology of mental retardation. Chicago, Ill.: Aldine Publishing Co., 1973.

Zimmerman, B. & Rosenthal, T. Observational learning of rule-governed behavior by children. Psychological Bulletin, 1974, 8 (1), 29-42.

TASK ANALYTIC ASSESSMENT OF SEVERE LEARNING PROBLEMS

Dennis R. Knapczyk

Abstract: Task analytic assessment provides a method which classroom teachers and other community service agents can utilize to assess the level of functioning of severely retarded individuals. Devices can be developed on an individualized basis by those working directly with the severely retarded; these then can be employed to suggest program goals and objectives, and to evidence the attainment of those objectives.

Formal assessment procedures have been developed and utilized to measure a wide variety of pupil oriented tasks, skills, and learning processes. Standardization of these instruments has made it possible to compare a single child's performance with that of a large sample of children of the same age group. Discrepancies observed between one child's responses and those of the comparison group suggest learning strengths or deficiencies. The results of formal diagnostic instruments can be utilized to plan learning activities to maximize learning potential (Bibb, 1972; Buckland & Balow, 1973; Halliwell & Solan, 1972; Waugh, 1973).

However, formal devices have a number of limitations which restrict their applicability to severely retarded populations. Because of standardization requirements, administration must be formalized. Sensory and communication deficits, which many severely retarded children exhibit, require modification of administration procedures (Guthrie, Butler, Gorlow, & White, 1964). Comparison of the results with a target population is therefore often inappropriate (Benton, 1970; Bialer, 1970; Bibb, 1972).

The large number of deficits areas which the severely retarded exhibit requires utilization of comprehensive devices (Gardner, 1971). However, time restrictions generally imposed by formal instruments necessitate that only a small sample of behavior characteristics of a particular deficiency area can be included (Gardner, 1967, Sarason & Gladwin, 1958). At best, formal assessment procedures yield only vague indications concerning specific learning problems of the severely retarded (Sarason & Doris, 1969).

Finally, few formal diagnostic instruments can be administered by special class teachers because of the intense training implied by the standardized methods of administration. Thus, the utility of formal instruments is dependent upon a clear channel of communication between the classroom teacher and the diagnostician, usually a school psychometrist or psychologist. Translation of test results into instructional strategies or learning packages requires extensive knowledge of diverse instructional materials and procedures. Often those who administer formal instruments have little formal teaching experience, and generally none with the severely retarded (Gardner, 1971, Stone & DeNevi, 1971).

Task Analytic Procedures

An alternate procedure for assessing performance of the severely retarded involves utilization of task analytic assessment procedures (Vallet, 1972). Task analysis has been cited as an effective instructional method for teaching skills to handicapped individuals (Minge & Ball, 1967). It involves the selection of a target task (e.g., face washing) and subsequent analysis into its component behaviors (e.g., picking up soap, rubbing soap on hands, rubbing hands on face, etc.). Each component behavior is learned sequentially and separately and is chained to those behaviors previously learned until the complete task can be performed without assistance. Individualized instruction can occur by altering task components and sequence to effectively utilize each child's entry skills (Lent, 1968; Lent, 1970; Toombs, 1971).

From The Education and Training of the Mentally Retarded. April, 1975, 10, (2), 74-77. Reprinted by permission.

Task analytic procedures can also be applied to the assessment of learning performance and evaluation of teaching methodology. The same process of specifying the component behaviors of tasks is employed. However, prior to training each component behavior, the child is requested to perform the task (Tilton, Liska, & Bourland, 1972). Assistance is provided by the administrant when required to insure that the child is given the opportunity to attempt each behavior. Thus, assistance is provided only when the child has made no attempt to perform the required behavior within a specified time interval (e.g., ten seconds). The degree and type of assistance can be coded and entries made for each task component. This process yields a clear profile of a child's strengths and weaknesses with respect to the specific skills assessed.

TABLE 1

Task analysis of the behaviors involved
in putting on and buttoning or zipping a coat.

Instructions: "Put your coat on."
Evaluation:
Duration:
start_____stop_____
Behaviors:
putting on coat
____picks up coat
____puts one arm in sleeve
____puts one arm through sleeve
____puts both arms in sleeves
____puts both arms through sleeves
____draws coat around shoulders
____draws fronts of coat around chest

Behaviors:
buttoning coat
____matches buttons to holes
____puts hole to button
____puts button partially through hole
____puts button completely through hole
____completes buttoning of coat
____number of buttons buttoned
____number of buttons possible to button
Behaviors:
zipping coat
____puts ends of zipper together
____inserts ends of zipper
____pulls upward on zipper tab
____holds bottom of coat and pulls tab upward
____zips coat partially
____zips coat completely

Table 1 illustrates a task analysis of the behaviors involved in putting on and buttoning or zipping a coat. Spaces are provided for entering the observed performance of the child along with the duration of task completion. Duration is included as a measure in assessment since some individuals are observed to be able to perform a task, but consume an excessive amount of time. A teacher observing this would focus upon amount of time to complete task as a training objective and not upon the specific behaviors involved. The analysis illustrated in Table 1 could be expanded to include a more discrete listing of behaviors, or be contracted depending upon the individual or group involved. Maintaining the same basic sequence and component behaviors would provide for comparison across children and groups for evaluation purposes.

Use of Profiles

A variety of codes can be utilized to designate the degree of assistance required to perform each component behavior. This coding can also be structured to reflect a sequential progression from complete independence in performance to no attempt at performance. Similarly, this format can be utilized to yield a profile which delineates the type of training appropriate for the individual (e.g., the fading of gestural and verbal cues and prompts). Coding of the degree of performance can be expanded or contracted to achieve the type of information for facilitating instructional programming.

The resulting profile of an individual's performance, as illustrated in Table 3, suggests the amount and type of training which the individual requires. In the sample assessment of a child's dressing skills, it was observed that this individual could pick up his coat and put an arm through a sleeve. However, he required verbal prompts to put the other arm in the coat and gestural prompts to draw it around the shoulders. It was necessary for the teacher to cooperate with the individual in drawing the coat

over his chest. For purpose of training, the teacher utilized a fading procedure to substitute verbal and gestural cues for direct assistance, and instructions and chaining of the behaviors for directive verbal and gestural prompts.

The child was unable to perform any of the behaviors involved in buttoning and it was necessary to train each behavior independently and chain the skills to those previously mastered. With zipping it was observed that the child cooperated in the initial fastening of the zipper, not responding to either verbal or gestural prompts. The child could independently pull up the zipper. In structuring a training program for this child, it was unnecessary to include zipping as a component.

TABLE 2

Sample code used for assessing the degree of assistance required in performing each task component.

W: child completes behavior without assistance
V: verbal cues are used to assist or prompt child
G: gestural cues are used to assist or prompt child
X: child and administrant cooperate in performing behavior
A: child makes no attempt to perform behavior

TABLE 3

Task analytic assessment of the behaviors required to put on and button or zipper a coat.

Instructions: "Put your coat on."
Evaluation:
Duration:
start 1 min. 30 secs.
stop 6 mins. 34 secs.
Behaviors:
putting on coat
W picks up coat
W puts one arm in sleeve
W puts one arm through sleeve
V puts both arms in sleeves
V puts both arms through sleeves
G draws coat around shoulders
X draws fronts of coat around chest

Behaviors:
buttoning coat
A matches buttons to holes
A puts hole to button
A puts button partially through hole
A puts button completely through hole
A completes buttoning of coat
0 number of buttons buttoned
6 number of buttons possible to button
Behaviors:
zipping coat
X puts ends of zipper together
X inserts ends of zipper
W pulls upward on zipper tab
A holds bottom of coat and pulls tab upward
W zips coat partially
G zips coat completely

Summary

Task analysis can be utilized for assessing a variety of objective skills pertinent to teaching the severely retarded. Some of these include social skills, pre-vocational training, self-help skills, communication, coordination, and others (Lent, 1970; Tilton, Liska, & Bourland, 1972). Likewise, each skill can be sequenced to parallel the progression of child development (Farnham-Diggory, 1972; Mills, 1972; Tilton, Liska, & Bourland, 1972). This would increase the utility of the assessment device in comparison to other groups with different levels of functioning.

In addition to utilizing task analysis for assessment, the same process can be employed for evaluation of programs. Pre-evaluation provides the basis for specifying the areas in which training is required. This assessment facilitates the development of instructional objectives. Readministration of

the assessment device subsequent to training would yield evidence for determining whether an objective has been attained (Knapczyk & Leimohn, 1973; Livingston & Knapczyk, 1973).

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References

Benton, A. L. Interactive determinants of mental deficiency. In H. Haywood (Ed.) Social-cultural aspects of mental retardation. New York: Appleton-Century-Crofts, 1970.

Bialer, I. Relationship of mental retardation to emotional disturbance and physical disability. In H. Haywood (Ed.) Social-cultural aspects of mental retardation. New York: Appleton-Century-Crofts, 1970.

Bibb, J. J. Measurement and evaluation of the migrant child. In A. B. Cheyney (Ed.) The ripe harvest: Educating migrant children. Coral Gables: University of Miami, 1972.

Buckland, P. & Balow, B. Effect of visual perceptual training on reading achievement. Exceptional Children, 1973, 39, 299-304.

Franham-Diggory, S. Cognitive processes in education. New York: Harper and Row, 1972.

Gardner, W. I. Use of the California Test of Personality with the mentally retarded. Mental Retardation, 1967, 5, 12-16.

Gardner, W. I. Behavior modification in mental retardation. Chicago: Aldine, 1971.

Guthrie, G., Butler, A., Gorlow, L., & White, G. M. Nonverbal expression of self-attitudes of retardates. American Journal of Mental Deficiency, 1964, 69, 42-29.

Halliwell, J. W. & Solan, H. A. The effects of a supplemental perceptual training program on reading achievement. Exceptional Children, 1972, 38, 613-621.

Knapczyk, D. R. & Liemohn, W. Theme instruction: an interdisciplinary model for service and training in special education. Working paper. Indiana University Developmental Training Center, Bloomington, 1973.

Lent, J. R. Mimosa Cottage: Experiment in hope. Psychology Today, 1968, 2, 51-58.

Lent, J. R. A demonstration program for intensive training of institutionalized mentally retarded girls. Detailed Progress Report: Five Year Summary. Bureau of Child Research, Parsons State Hospital and Training Center, 1970.

Livingston, G. A. & Knapczyk, D. R. Learning economy: a token reinforcement system designed for the special education classroom. Paper presented to 51st annual meeting of the Council for Exceptional Children. Dallas, 1973.

Mills, Belen Collantes (Ed.). Understanding the young child and his curriculum: Selected readings. New York: MacMillan, 1972.

Minge, M. & Ball, T. Teaching of self-help skills to profoundly retarded patients. American Journal of Mental Deficiency, 1967, 71, 864-868.

Sarason, S. B. & Doris, J. Psychological problems in mental deficiency. New York: Harper and Row, 1969.

Sarason, S. B. & Gladwin, T. Psychological and cultural problems in mental subnormality: A review of research. Genetic Psychology Monographs, 1958, 57, 3-290.

Stone, J. C. & DeNevi, D. (Eds.). Teaching multi-cultural populations. New York: Van Nostrand Reinhold, 1971.

Tilton, J. R., Liska, D. C., & Bourland, J. D. (Eds.). Guide to early developmental training. Lafayette: Wabash Center for the Mentally Retarded, 1972.

Toombs, L. Title I project evaluaton report. Parsons, Kansas: Parsons State Hospital and Training Center, 1971.

Vallet, R. E. Developmental task analysis and psycho-educational programming. Journal of School Psychology, 1972, 10, 127-134.

Waugh, R. P. Relationship between modality preference and performance. Exceptional Children, 1973, 39, 465-469.

ASSESSMENT TOOLS FOR USE WITH THE SEVERELY MULTIPLY HANDICAPPED

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Introduction

Teachers of severely multiply handicapped children are faced with an awesome task -- producing change in individuals whose rate of change is difficult to measure and whose ability to change may be hidden by multiple handicaps.

Developers of assessment tools have been convinced that change can and does occur, and have task-analyzed behaviors into observable, measureable terms.

This resource booklet was compiled to provide a link between the classroom teacher/multi-disciplinary team and those assessment tools appropriate for use with a severely multiply handicapped population.

Scales have been chosen for review for one of two reasons: they are currently being used in classrooms for the severely multiply handicapped in Kansas, and/or they are on lists or published bibliographies of materials recommended for use with this population. Materials reviewed range from simple checklists of behavior to extensive teaching ideas/curricula.

This booklet will be in a continual state of update and revision. Comments concerning any inaccuracies or suggested clarification are most welcome. New materials will be reviewed and added from time to time, and suggestions of materials for inclusion would be appreciated.

Special Education Administration 913-296-3866
Kansas State Department of Education
120 East 10th
Topeka, Kansas 66612

With assistance from:

The Midwest Regional Resource Center, Des Moines, Iowa

March, 1977

1. *Name:* AAMD Adaptive Behavior Scales, 1974 Revision
2. *Authors:* Kazuo Nihira, Ray Foster, Max Shellhaas, Henry Leland

3. *Address for Ordering:*
   American Association on Mental Deficiency
   5201 Connecticut Avenue, N.W.
   Washington, D.C. 20015
   Telephone: (202) 686-5400

4. *Price:* Manual, $5.00. Scale, Scoring Sheet, Profile Summary, $1.00; or 100 for $50.00

5. *Administered by:* Psychologist, trained teacher

6. *Method of Assessment:* Observation, parental interview

7. *Population for whom Intended:* Mentally Retarded children and adults

8. *Standardized:* Yes

9. *Components:*

   Part I.

   Measures level of development in independent functioning, physical development, economic activity, language development, number and time concepts, domestic activity, vocational activity, self-direction responsibility, and socialization.

   Part II.

   Measures the presence or absence of mal-adaptive behaviors, including violent and destructive behaviors, anti-social behavior, rebellious behavior, untrustworthiness, withdrawal, stereotypical behavior, inappropriate interpersonal behavior, unacceptable vocal habits, unacceptable or eccentric behaviors, self-abusive behavior, hyperactivity, sexually aberrant behavior, psychological disturbances, and use of medication.

10. *General Description:*

This scale attempts to measure some of the ways people act in different situations. It is a measure of how the child has been able to adapt to his environment, rather than a measure of intellectual capacity.

1. *Name:* Allied Agencies Functional Profile: Developmental Training Program (c. 1974)

2. *Author:* Compiled from standardized tests

3. *Address for Ordering:*
   Peoria Association for Retarded Citizens & United Cerebral Palsy of Peoria
   320 E. Armstrong Avenue
   Peoria, Illinois 61603
   Telephone: (309) 672-6308

4. *Price:* No cost

5. *Administered by:*
   Classroom teacher; person with basic knowledge and experience with normal growth and development of infants and young children.

6. *Method of Assessment:*
   Direct observation in familiar surroundings; parental interview.

7. *Population for whom Intended:* Retarded

8. *Standardized:* No

9. *Components:* Assesses level of functioning in six areas:

   1. Social
   2. Cognitive, Linguistic, and Verbal
   3. Gross Motor
   4. Fine Motor
   5. Eating
   6. Toileting

10. *General Description:*

    The Functional Profile is a checklist of developmental skills and social traits that normal infants and young children usually acquire or can perform at certain ages. By completing the checklist, one can determine the approximate level of functioning for the child in each area; results can be used to aid in program planning. This profile is a gross indicator of functioning; no fine discrimination is made between levels. It is a profile for normal, not handicapped children, but will give the assessor an idea of how a child compares to a normal child. (Does not give step-by-step tasks for remediation of weak areas.)

1. *Name:*
   A Manual for the Assessment of a Deaf-Blind Multiply-Handicapped Child, revised edition, 1975

2. *Authors:* Michael T. Collins, James M. Rudolph

3. *Address for Ordering:*
   Midwest Regional Center for Services to Deaf-Blind Children
   P. O. Box 420
   Lansing, Michigan 48902

4. *Price:* Free in limited quantities; duplication allowed

5. *Administered by:* Classroom teacher

6. *Method of Assessment:*
   Direct observation. It is suggested that this instrument be administered twice yearly (November and May) over a 3-year period to measure growth.

7. *Population for whom Intended:* Deaf-blind, multiply handicapped children

8. *Standardized:* No

9. *Components:* Introduction, background information — 6 color-coded areas

   1. Personal self-help (green)
   2. Social development (pink)
   3. Gross motor development (green)
   4. Fine motor development (gold)
   5. Language (blue)
   6. Cognition (pink)

   Each area contains items which are marked when the child 'can do' them. Space is provided for initial evaluation and 5 subsequent assessments.

10. *General Description:*
    This scale is an outgrowth of the Early Childhood Development Scales (Meyer Children's Rehabilitation Institute), The Normal Development Scale (San Francisco State University), and Developmental Scales for the Deaf-Blind (Mountain Plains Regional Center for Services to Deaf-Blind Children). It was developed to approximate the early developmental sequence of deaf-blind children. It reflects the development of deaf-blind children more accurately than do scales for children without sensory impairments. This is an instrument for measuring the progress of children and is not intended as a curriculum guide.

1. *Name:*
   APT, A Training Program for Citizens with Severely or Profoundly Retarded Behavior (1974)

2. *Author:* Edited by Hames F. Brody, Ph.D., and Robert Smolitz, EDD

3. *Address for Ordering:*
   Pennhurst State School
   Spring City, Pennsylvania 19475
   Telephone: (215) 948-3500

4. *Price:* $10.00

5. *Administered by:* Teachers, aides

6. *Method of Assessment:*
   Student is tested on each item; 3 minute time limit.

7. *Population for whom Intended:*
   Severely/profoundly retarded adolescents and adults.

8. *Standardized:*
   Yes. 40 male, 40 female adult severely and profoundly retarded residents of Pennhurst State School, between the ages of 11 and 56.

9. *Components:*
   The APT consists of 36 statements that describe specific activities and skills. The student is assessed once on each item. If the student does not respond in 3 minutes, a 'no' is scored. One 'no' item is then selected for training. Each of the 36 items is task analyzed with suggested activities for training that item. The APT, then, contains

   1. 36 behavioral statements
   2. Training package
   3. Scoring sheets, graph
   4. Standardization information

10. *General Description:*
    The APT was developed for institutionalized citizens who exhibit severely or profoundly retarded behavior. The materials were designed for child care workers with basic behavior modification knowledge, but can be modified for use by teachers, aides, or parents in community settings.

1. *Name:* Balthazar Scales of Adaptive Behavior (1973)

2. *Author:* Earl E. Balthazar

3. *Address for Ordering:*
   Consulting Psychologist Press, Inc.
   577 College Avenue
   Palo Alto, California 94306
   Telephone: (415) 326-4448

4. *Price: Balthazar I:*
   25 Scoring Forms - $8 (1 sample in set); 100 forms - $30.00
   Handbook - 4
   Rater's Handbook - 4
   Training Manual - 1.75

   Balthazar II:
   Specimen Set
   $5: 1 each of tally sheet, scoring summary, prebaseline and baseline forms
   1 manual

   Items bought separately: 1 pad tally sheets (50 sheets) = $3.50; scoring summary 25 packets = $2.00, 100 = $7.50; prebaseline 25 = $2.00, 100 = $7.50
   Manual: $4.75; Supplemental information & program 25 = $2.50, 100 = $7.50; Booklet: *Training the Retarded* = $5.00
   Complete Kit & Manual (enough for 20 administrations) - $16

5. *Administered by:* Classroom teachers, supervisors, ward personnel

6. *Method of Assessment:* Direct Observation

7. *Population for whom Intended:* Ambulatory severely/profoundly retarded

8. *Standardized:*
   Yes, ambulatory individuals, ages 5-57; residents of Central Wisconsin Colony and Training School

9. *Components:*
   Section I:
   Scales of Functional Independence (Eating, Dressing, Toileting)
   Section II:
   8 additional social scale categories describing coping behaviors.

10. *General Description*
    This scale is recommended for providing objectives for the design and development of behavioral programs, for providing a standardized method of measurement, evaluation, and feedback.

1. *Name:* Basic Skills Screening Test, 1974

2. *Authors:* Robert L. Schalock, Barbara E. Ross, Irwin Ross

3. *Address for Ordering:*
   Mid-Nebraska Mental Retardation Services
   518 Eastside Boulevard
   Hastings, Nebraska 68901
   Telephone: (402) 462-5107

4. *Price:* $22.00

5. *Administered by:* Teachers, community agencies

6. *Method of Assessment:* Direct interaction with client

7. *Population for whom Intended:* Trainable mentally retarded, community-based

8. *Standardized:* Yes

9. *Components:*
   Screening test to evaluate target behaviors
   Remediation manual

   The following 7 areas are screened with remediation activities suggested for deficit skills:

   1. Sensory-motor functioning
   2. Visual processing
   3. Auditory processing
   4. Language
   5. Symbolic operation
   6. Social-emotional development
   7. Work skills

   This instrument identifies target behaviors, provides teaching objectives remediation activities materials, and "movement cycle" profile sheet.

10. *General Description:*
    The Basic Skills Screening Test was designed to objectively test target behaviors and suggest remediation activities for community based handicapped citizens. This screening test has vinyl covers, a nice format, and comes in 2 easy-to-use manuals.

1. *Name:* Bayley Scales of Infant Development

2. *Author:* Nancy Bayley

3. *Address for Ordering:*
   The Psychological Corporation
   757 3rd Avenue
   New York, New York 10017
   Telephone: (212) 754-3500

4. *Price:* $98.00

5. *Administered by:* Psychologist, doctor, trained teacher

6. *Method of Assessment:* Observation, parental interview

7. *Population for whom Intended:* Normal, or developmental age 0-30 months

8. *Standardized:* Yes

9. *Components:*

   Mental Scale: 163 items in developmental sequence
   Motor Scale: 81 items in developmental sequence

10. *General Description:*
    The Bayley Mental and Motor Scales consist of specific statements describing observable responses which the assessor attempts to elicit through direct interaction with the child. It is a scale which follows normal developmental sequence from 0-30 months.

1. *Name:* Behavioral Characteristics Progression (1973)

2. *Author:*

3. *Address for Ordering:*
   VORT Corporation
   P. O. Box 11132
   Palo Alto, California 94306
   Telephone: (415) 328-4366
   Publishers: Santa Cruz Co. Office of Education

4. *Price:* $6.95 each (booklet, charts No. 59); 3/set $3.95; Binder $8.95

5. *Administered by:* Special Education teacher, team, child care workers

6. *Method of Assessment:* Direct observation

7. *Population for whom intended:* Mentally and behaviorally exceptional children

8. *Standardized:* No

9. *Components:*

   The BCP consists of 2400 observable traits referred to as behavioral characteristics grouped into categories of behaviors called behavior strands.

10. *General Description:*

    The BCP is a non-standardized continuum of behaviors in chart form. It can be put on the wall to chart an individual child's growth/behavior over long periods of time. It is an observation tool, not a testing instrument. It involves assessment of existing behaviors. Although not a curriculum it can be used to derive appropriate objectives. The BCP serves as a communication tool among staff members because a child's status is easily observed by all. BCP 46-59 contain strands particularly appropriate for the deaf, blind, and orthopedically handicapped.

1. *Name:* Callier-Azusa Scale (c. 1974)

2. *Author:* Robert Stillman, Ph.D. (Ed.) et al.

3. *Address for Ordering:*
   Collier Center for Communication Disorders
   1966 Inwood Road
   Dallas, Texas 75235
   Telephone (214) 638-1100

4. *Price:* No cost

5. *Administered by:*
   Teacher and/or parent (someone thoroughly familiar with the child's behavior; preferably consensus of several persons.)

6. *Method of Assessment:* Observation

7. *Population for whom Intended:* Deaf-blind and multiply handicapped children

8. *Standardized:* No

9. *Components:*

   1. Directions
   2. Motor Development
   3. Perceptual Abilities
   4. Daily Living Skills
   5. Language Development
   6. Socialization

   Each area includes subscales made up of sequential steps describing developmental milestones.

10. *General Description:*

    The Callier-Azusa Scale is a scale of normal development designed specifically to aid in the assessment of deaf-blind and multiply handicapped children. Its three primary uses are: 1) to assess the developmental level of children for whom other methods of assessment are inadequate because (a) they require of the child language abilities, cooperation, or intact sensory modalities; or (b) because the tests lack comprehensiveness at lower levels; 2) to measure progress over time; and 3) to provide guidance for planning developmentally appropriate programs for individual children. (Text)

1. *Name:* Camelot Behavioral Checklist

2. *Author:* Ray W. Foster

3. *Address for Ordering:*
   Camelot Behavioral Systems
   P. O. Box 3447
   Lawrence, Kansas 66044
   Telephone:

4. *Price:* $3.00 per manual, 25 cents each for checklists, plus shipping charges

5. *Administered by:* Classroom teacher, paraprofessional

6. *Method of Assessment:*
   One person or team of persons familiar with child fills out checklist from memory; or, direct observation.

7. *Population for whom Intended:* Trainable youths

8. *Standardized:* Yes

9. *Components:* 399 behavioral descriptions grouped in 10 domains, arranged in order of difficulty

   1. Self-help
   2. Physical development
   3. Home duties
   4. Vocational behaviors
   5. Economic behavior
   6. Independent travel
   7. Numerical skills
   8. Communication skills
   9. Social behavior
   10. Responsibility

10. *General Description:*

    The Camelot was designed to identify specific training objectives for an individual and then to provide a score based on these objectives. Once target behaviors have been determined, a Skill Acquisition Program Bibliography (Tucker) is used to identify programs developed for this behavior.

1. *Name:* Denver Development Screening Test

2. *Authors:* William K. Frankenburg, M.D., Josiah B. Dodds, Ph.D., Alma W. Fandal

3. *Address for Ordering:*
   The LaDoca Company, Project & Publishing Foundation, Inc.
   East 51st and Lincoln
   Denver, Colorado 80216
   Telephone: (303) 222-3605

4. *Price:* $2.00 per 100 sheets; Manual $4.00, plus 10% shipping and handling if under $25.00. Order pre-paid.

5. *Administered by:* Nurses, paramedics, teacher aides; by persons with no special training in psychological testing.

6. *Method of Assessment:* Child is tested on 20 sample items; some parental reporting accepted.

7. *Population for whom Intended:*
   This test was designed to detect delays and abnormalities in normal development.

8. *Standardized:*
   Yes, this test was standardized on 1000 normal children in the Denver area to see at what ages they could do each of the items.

9. *Components:*
   105 items written in range of accomplishments for children between birth and 6 years of age. These items are arranged on the test form in four sections:

   1. Personal-social
   2. Fine-motor, adaptive
   3. Language
   4. Gross Motor

   A bar on the test profile indicates the ages at which 25%, 50%, 75%, and 90% of normal children are able to perform particular items.

10. *General Description*

    The DDST was designed and standardized to meet the need of having a simple, useful tool to aid in the discovery of children with developmental problems. Since many causes of slow development can be treated if diagnosed early, it is important to find children with problems in development and behavior as soon as possible. (from test.)

1. *Name:* The Developmental Record, (1974)

2. *Authors:* W. O. Hutton, L. W. Talkington

3. *Address for Ordering:*
   Continuing Education Publications
   1633 Southwest Park Avenue
   Box 1491
   Portland, Oregon 97207
   Telephone: (503) 229-4843

4. *Price:* $3.50 for one copy, plus 50 cents shipping.

5. *Administered by:* Teacher, multi-disciplinary team, parents, aides, home visitors professionals acquainted with the individual's level of development.

6. *Method of Assessment:* Items are marked if it is known that the individual can perform them; if it is not known how the individual will perform, he or she is tried or "tested" on particular items in question, or representative items.

7. *Population for whom Intended:* Developmentally delayed.

8. *Standardized:* Reliability and validity information included in manual.

9. *Components:* The DR is essentially a behavior rating scale. Five major developmental sections (self-care, perceptual-motor, social, communication and self-direction) are represented by twenty descriptions, each of which has been scaled into nine steps ranging from complete dependence to functional independence. Seven additional scales are provided under optional designation for special categories such as handicapped or behavior problems. Three levels of independence are suggested: a) dependence (roughly normal development up to one and one-half years); b) semi-independent (roughly two to five and one-half years); and c) independent (roughly six years to maturity). (text)

10. *General Description:* The developmental record is designed as a convenient instrument which can be used by various levels of observers to obtain a rapid descriptive picture of individual functioning and progress along a developmental continuum. The primary focus is on the identification of developmental benchmarks.

1. *Name:* Developmental Scales: to be used in assessing the development of deaf-blind children

2. *Author:* Mountain Plains Regional Center for Handicapped Children

3. *Address for Ordering:*
   165 Cook Street
   Denver, Colorado 80206
   Telephone: (303) 399-3070

4. *Price:* Free in limited quantities; duplication allowed

5. *Administered by:* Classroom teacher

6. *Method of Assessment:* Direct observation, put through

7. *Population for whom Intended:* Deaf-blind, multiply handicapped

8. *Standardized:* No

9. *Components:* 177 items in 7 major areas of development

   1. Personal, self-help development
   2. Social development
   3. Gross motor development
   4. Fine motor development
   5. Communication development
   6. Visual development
   7. Cognitive development

   Also included are a child study report form, a sample summary evaluation and sample behavioral objectives. A glossary of visual terms and definitions is included.

10. *General Description:*

    This scale was compiled from several existing scales and from observation of deaf-blind children. The format was designed to serve as a means of obtaining baseline data appropriate for use by teachers in the classroom setting. The seven major areas covered represent samples of the various critical behaviors in the child's development. (Text)

1. *Name:* Education for Multi-handicapped Infants Assessment Scale, 1975

2. *Author:* Dr. Wanda B. Elder

3. *Address for Ordering:*
   Department of Pediatrics
   University of Virginia Medical Center
   Box 232
   Charlottesville, Virginia 22901
   Telephone: (804) 924-5161

4. *Price:* $1.00 per copy pre-paid, payable to the University of Virginia. Other materials (bibliography) available. Enclose 50 cents for postage.

5. *Administered by:* Classroom teacher

6. *Method of Assessment:* Direct observation

7. *Population for whom Intended:* Multi-handicapped infants, birth to 24 months.

8. *Standardized:* No

9. *Components:* This scale provides for evaluation of functioning in five areas of development:

   1. Gross motor
   2. Fine motor
   3. Socialization
   4. Cognition
   5. Language

   Each area contains three behavior items for each month from birth to 24 months.

10. *General Description*

    This scale is intended to provide information to direct individualized planning for infants; results can be translated into instructional objectives. It is for use by the infant intervenor in individualized diagnostic and prescriptive teaching of infants. Used as a checklist it is an easily administered, concise, color-coded scale.

1. *Name:* Fairview Behavior Evaluation Battery (c. 1974)

2. *Authors:* Robert T. Ross, Ph.D., Alan Boroskin, M.A., James S. Giampiccolo, Jr.

3. *Address for Ordering:*
   Research Department, Fairview State Hospital
   2501 Harbor Boulevard
   Costa Mesa, California 92626
   Telephone: (714) 545-9331

4. *Price:*

   Developmental Scale.....$10.00 per 100
   Self-help Scale.....$10.00 per 100
   Social Skills Scale.....$10.00 per 100
   Language Scale.....$10.00 per 100
   Problem Behavior.....$10.00 per 100

   Manuals 50 cents each
   Samples, one copy of one scale, with manual $1.00 per set
   Samples, specimen set, 1 of each of 5 scales, one of each manual: $3.00

5. *Administered by:* Person who knows individual; teacher, parent caretaker, ward personnel

6. *Method of Assessment:* The observer circles the number preceding the statement which best describes the individual's typical behavior, not past performance or inferred potential.

7. *Populaton for whom Intended:* Designed for mildly, moderately, severely and profoundly retarded individuals, depending on scales given.

8. *Standardized:* Yes. This scale was designed, constructed, and standardized at the Fairview State Hospital for the mentally retarded in California. Standardization data, including measures of reliability and validity are included in manuals.

9. *Components:* The Fairview Behavior Evaluation Battery consists of 5 scales:

   1. *The Fairview Developmental Scale:* 26 items providing measures of perceptual and motor skills, self-help skills, language, social interaction, and self-direction. The items proceed by small increments so that the scores can reflect subtle changes in behavior. This scale is particularly applicable to the severely/profoundly handicapped population because it gives sensitive measurements below the two-year level.

   2. *The Fairview Self-Help Scale:* 34 items for use in the 2-9 year range for measuring motor dexterity, self-help skills, communication, social interaction and self-direction.

   3. *The Fairview Social Skills Scale:* This scale consists of 36 items which provide measures of self-help skills, communication, social interaction, occupation, and self-direction. It is recommended for use where the behaviors seem to be at, or above, the 10-year level.

   4. *The Fairview Language Evaluation Scale:* This scale measures language age from 0-72 months.

   5. *The Fairview Problem Behavior Record:* This instrument is used to rate 29 problem behaviors as to their frequency, severity, and control. A manual is not provided; an

instruction sheet accompanies the scale.

10. *General Description:*

The 5 Scales comprising the Fairview Behavior Evaluation Battery were designed to measure behaviors and skills among all levels of retarded individuals, ages 0-above 10. Each scale is short and easily administered and scored. The scales may be used to measure improvement in individuals or groups. The Development Scale is particularly applicable to low-functioning persons.

1. *Name:* Koontz Child Developmental Program (1976): Training Activities for the First 48 Months

2. *Author:* Charles W. Koontz, Ed.D.

3. *Address for Ordering:*
   Western Psychological Services
   Publishers and Distributors
   12031 Wilshire Boulevard
   Los Angeles, California 90025
   Telephone: 213-478-2061

4. *Price:* Kit (Book & Record Card) W-136 = $12.00; Book only W-136B = $9.00, plus 8% for shipping and handling charges.

5. *Administered by:* Classroom teacher

6. *Method of Assessment:* Direct observation of and/or performance of items after one week of observation. Begin where child is, rather than at beginning of each section.

7. *Population for whom Intended:* Normal child, 0-48 months.

8. *Standardized:* Yes. Validity and reliability information included in material.

9. *Composers:* The Koontz provides for evaluation of performance in these areas:

   Gross motor
   Fine motor
   Social
   Language

   The page following each evaluation item contains activities for training that skill.

10. *General Description:* The Koontz is a program for children who are developmentally between 0-48 months. It provides evaluation and training activities to train skills for each month from 1 to 48.

1. *Name:* Learning Accomplishment Profile for the Young Child (1974)

2. *Author:* Edited by Anne R. Sanford

3. *Address for Ordering:*
   Chapel Hill Training-Outreach Project
   Lincoln Center, Merritt Mill
   Chapel Hill, North Carolina 27514
   Telephone: (919) 967-8295

4. *Price:* $1.50 to cover production, handling, and mailing; prescriptive - $2.00

5. *Administered by:* Teachers

6. *Method of Assessment:* Child is tested on items; also, direct observation

7. *Population for whom Intended:* Handicapped (at least trainable level)

8. *Standardized:* No

9. *Components:* A manual describing the LAP and how to use it.
   A recording booklet in 3 sections:

   Section 1 —
   Behavioral contains a hierarchy of developmentally appropriate behaviors and provides a basis of evaluation of the child's existing skills in six areas: gross motor, fine motor, social, self-help, cognitive, and language.

   Section 2 —
   Task Analysis provides guidance in sequencing skill development and a system of recording responses on a specific task.

   Section 3 —
   Unit Development contains 44 weeks of curriculum units ready-made teaching sequence.

10. *General Description:*

    The Learning Accomplishment Profile is designed to provide the teacher of the young handicapped child with a simple, criterion-referenced record of the child's existing skills. Use of the LAP enables the teacher to: identify developmentally appropriate learning objectives for each individual child, measure progress through changes in the rate of development, and provide specific information relevant to pupil learning. The LAP Infant Development Checklist may be more appropriate, but does not have a curriculum manual.

1. *Name:* LAP I - Learning Accomplishment Profile for Infants

2. *Authors:* Patricia M. Griffin, Anne R. Sanford

3. *Address for Ordering:*
   Kaplan School Supply Corporation
   600 Jonestown Road
   Winston-Salem, North Carolina 27103
   Telephone: (919) 768-4450

4. *Price:* $3.00 per manual

5. *Administered by:* Parent, teacher

6. *Method of Assessment:* Observation

7. *Population for whom Intended:* Child age 0-33 months

8. *Standardized:* No

9. *Components:*

   LAP I - Section 1 —— Developmental data. A hierarchy of behaviors listed in developmental sequence, evaluates infants' existing skills in gross motor, fine motor, social self-help, cognitive and language areas.

   LAP I - Section 2 —— Detailed instruction and recording charts provide a method for teaching important behaviors in the sequence of development.

10. *General Description*

    The Learning Accomplishment Profile for Infants (LAP-I) is designed to provide the parent or teacher of the handicapped infant with a simple criterion-referenced record of the child's existing skills. The LAP, therefore, identifies the next appropriate step in the development of the individual child and gives detailed instructions for reaching this objective. (Text)

1. *Name:* Maxfield Buchholz Scale of Social Maturity for use with Pre-School Blind children

2. *Authors:* Katherine Maxfield and Sandra Buchholz

3. *Address for Ordering:*
   American Foundation for the Blind
   15 West 16th
   New York, New York 10011
   Telephone: (212) 924-0420

4. *Price:* 74 cents each

5. *Administered by:* Classroom teacher

6. *Method of Assessment:* Observation, parental interview

7. *Population for whom Intended:* Legally blind, developmental ages 0-6

8. *Standardized:* Yes

9. *Components:* Six sections covering items of social, gross motor, communication, occupation, dressing, eating, and toileting skill.

10. *General Description:*

    The Maxfield Buchholz scale is a standardized test of social maturity to be used for comparing the development of legally blind children to other legally blind children.

1. *Name:* Project MEMPHIS Instruments for Individual Program Planning and Evaluation (Comprehensive Developmental Scale)

2. *Author:* Alton D. Quick, Thomas L. Little, A. N. Campbell

3. *Address for Ordering:*
   Fearon Publishers
   6 Davis Drive
   Belmont, California 94002
   Telephone: (415) 592-7810

4. *Price:* Single set of 3 forms $1.50; 25 in a set, includes 2 guides $11.00 (Single set includes comprehensive developmental scale, assignment record and continuous record for educational developmental gain)

5. *Administered by:* Classroom teacher

6. *Method of Assessment:* Direct observation, put through

7. *Population for whom Intended:* Children with a developmental age between 3 months and 5 years.

8. *Standardized:* No

9. *Components:* Developmental evaluation of:

   1. Personal-social skills
   2. Gross motor skills
   3. Fine motor skills
   4. Language skills
   5. Perceptual-cognitive skills

10. *General Description:*

    The MEMPHIS is an easily administered developmental scale yielding a developmental age for a child in each of 5 areas.

1. *Name:* Pennsylvania Training Model, Individual Assessment Guide

2. *Authors:* Ellen Somerton, Keith Turner

3. *Address for Ordering:*
   Dr. Duffy, Regional Resource Center
   443 S. Gulph Road
   King of Prussia, Pennsylvania 19406
   Telephone: (215) 265-3706

4. *Price:* $3.25 per copy

5. *Administered by:* Classroom teacher

6. *Method of Assessment:* Direct observation, put through

7. *Population for whom Intended:* Multiply-handicapped public school children

8. *Standardized:* No

9. *Components:*

   1. Curriculum Assessment Guide (gross assessment in major areas)
   2. Competency Checklists (specific assessment within areas)
   3. Individual Prescriptive Planning Sheet (detailed analysis of one skill)
   4. Continuous data sheet
   5. Annotated bibliography

10. *General Description*

    The Pennsylvania Training Model Educational Planning System was designed to assist teachers in the development of specific programs for the severely and profoundly mentally retarded and multi-handicapped. Its use provides a broad assessment of the individual's total needs.

1. *Name:* Portage Project Checklist (revised)

2. *Authors:* David Shearer, James Billingsley, Alma Frohman, Jean Hilliard, Francis Johnson, Marsha Shearer

3. *Address for Ordering:*
   Portage Project, Cooperative Educational Service Agency 12
   412 East Slifer Street
   Portage, Wisconsin 53901
   Telephone: (608) 742-5342

4. *Price:* $32.00 includes a manual, an Activity Card File and 3 checklists

   Extras: Packages of 15 - $6.50 plus postage

5. *Administered by:* Classroom teachers, aides, parents

6. *Method of Assessment:* Observation; direct knowledge of child

7. *Population for whom Intended:* Handicapped or normal, mental ages 0-5 years

8. *Standardized:* No

9. *Components:*

   Part I:
   Checklist of Behaviors
   Part II:
   Card file containing curriculum ideas

   Both are color-coded and are divided into 5 categories: 1. Cognitive; 2. Self-help; 3. Motor; 4. Language; 5. Socialization. Items not scored as "entry behaviors" are potential target behaviors which can be organized into a curriculum sequence.

10. *General Description:*

    The Portage consists of a checklist of skills/behaviors and an activity card file. Those skills the child cannot yet perform are targeted for programming, with teaching ideas suggested in the activity card file.

1. *Name:* RADEA: Teaching Manual; Testing and Remediation (c. 1976)

2. *Author:* Dallas County Mental Retardation Center

3. *Address for Ordering:*
   Melton Book Company, Inc.
   111 Leslie
   Dallas, Texas 75207
   Telephone: (214) 748-0564

4. *Price:* $395.00 plus $5.00 postage; includes teaching manual, 564 task cards, 3 cassette tapes, 29 picture cards, 10 Radea/Graphic sheets, 50 task trial sheets, 1000 daily progress charts, 50 individual progress profiles, and 280 Radea Manuscript pages.

5. *Administered by:* Classroom teacher

6. *Method of Assessment:* Direct observation

7. *Population for whom Intended:* For training behaviors of students who are functioning between the developmental ages of 0-7 years.

8. *Standardized:* No. Field tested in Austin Zero-Reject Program

9. *Components:*

   Five areas of instruction critical to effective functioning are analyzed and structured into component tasks representing steps involved in the mastery of that particular cognitive function:

   1. Visual perception
   2. Auditory perception
   3. Perceptual motor
   4. Oral language
   5. Functional living

10. *General Description:*

    The RADEA materials are a total curriculum designed for training behaviors of students who are functioning between the developmental ages of 0 and 7 years. They concentrate on the attainment of specific functional perceptual skills. In effect these materials represent a program placement test for students entering a special education program and serve to evaluate their progress periodically. A unique feature of this system is the availability of a rental in-service program to train persons in the use of RADEA materials.

1. *Name:* The TARC Assessment System

2. *Authors:* Wayne Sailor, Bonnie Jean Mix

3. *Address for Ordering:*
   H & H Enterprises
   P. O. Box 3342
   Lawrence, Kansas 66044
   Telephone: 843-4793

4. *Price:* $5.95 (one instruction manual and 10 assessment inventories); include 21 cents tax for Kansas residents

5. *Administered by:* Classroom teacher

6. *Method of Assessment:* Observation of child's behavior in group or class setting; putting child through some skill-tapping activities.

7. *Population for whom Intended:* Severely handicapped

8. *Standardized:* Yes. This scale was standardized on 283 severely handicapped children, both sexes, ages 2-15, mentally retarded and related handicaps, in degree from profound to mild; institutional and day-service center population.

9. *Components:* 4-stage process including:

   1. Assessment (in four areas of skill development: self-help, motor, social, and communication)
   2. Profiling
   3. Deriving instructional objectives
   4. Curriculum selection (involves a computer retrieval system to match skill deficits with existing curricula)

10. *General Description:*

    The TARC System is intended to provide educators of handicapped children, including the severely and profoundly retarded, with a self-contained procedure for arriving at a curriculum from instructional objectives based on a behavioral assessment technique. It selectively taps a few skills in each domain and gives a general picture of the child's level of functioning based on a narrow sampling of behaviors. A computer retrieval system service is offered for matching skill deficits to existing, available curricula.

1. *Name:* TMR Performance Profile for the Severely and Moderately Retarded, 1970

2. *Authors:* Alfred J. DiNola, Bernard P. Kaminsky, Allan E. Sternfeld

3. *Address for Ordering:*
   Educational Performance Associates
   563 Westview Avenue
   Ridgefield, New Jersey 07657
   Telephone: (201) 941-1425

4. *Price:* Manual, Record Booklet, Chart — $5.00

5. *Administered by:* Teacher, paraprofessional

6. *Method of Assessment:* Observation, memory

7. *Population for whom Intended:* Trainable mentally retarded

8. *Standardized:* Yes

9. *Components:* One page each for rating:

   1. Social Behavior
   2. Self-care
   3. Communication
   4. Basic Knowledge
   5. Practical Skills
   6. Body Usage

   Profile sheet for summary of scores of each area. Each item in major areas rated from 0-4 depending on level of competence.

10. *General Description:*

    An easy-to-administer scale for rating the skills of trainable-level children. Appropriate for severely multiply-handicapped children who have developed some level of independence.

1. *Name:* Vineland Social Maturity Scale

2. *Author:* Edgar Doll, Ph.D.

3. *Address for Ordering:*
   American Guidance Service, Inc.
   Publisher's Building
   Circle Pines, Minnesota 55014
   Telephone: (612) 786-4343

4. *Price:* Specimen Set, including one record blank and the Manual, $2.10 (Catalog No. 1233); Manual for Vineland (28 pages), $1.90; Record blanks sold in packages of 25, $2.90 per package (catalog No. 1231).

5. *Administered by:* Psychologist, trained teacher

6. *Method of Assessment:* parental interview, observation

7. *Population for whom Intended:* Normally developing children and adults, ages 0-25 years

8. *Standardized:* Yes

9. *Components:* A checklist of skills attained at yearly intervals in the areas of self-help, communication, self-direction, socialization, locomotion, and occupation.

10. *General Description:*

    This scale is designed to measure the level of social maturity of normally developing children and adults. It is not sensitive to small changes in behavior.

User Review Section

The following comments have been collected from persons working in Kansas with severely multiply handicapped students. Their opinions are enclosed in order to provide a more well-rounded booklet.

1. **AAMD Adaptive Behavior Scale.**

   I think this scale is appropriate for our population, but I think some of the items could be broken down into more steps and be therefore more helpful in writing objectives.

   Carolyn Murphy
   Winfield State Hospital

2. **Bayley Scales of Infant Development.**

   This is fairly easily administered. It does not require a lot of observation to give reliable data. The measurements are a little too large for severely/profoundly retarded children. Doesn't allow for additional handicaps.

   Nancy Callahan
   KNI, Topeka

3. **BCP: Behavioral Characteristics Progression.**

   We are considering using this as the basis for our IEPs from EMR, LD, on down since it can be used uniformly throughout, is well-structured, and gives us a starting point from which to adapt to our situation as we use it. It is easy to use, not hard to interpret, and lends itself to planning IEPs.

   Carol Nigus
   Hiawatha

   Very detailed. Takes a long time to assess, but good if you have the time.

   Patsy Galligan
   SMH Teacher, Pratt

4. **Callier-Azusa Scale.**

   The Callier Azusa gives you a good picture of normal development but it is lengthy and often does not aid in finding the correct instructional objectives one should start with.

   Glenna Alderson
   SMH Teacher, Topeka

5. **Camelot Behavioral Checklist.**

   Easy to use; too high for profoundly retarded.

   Judy Fillmore
   Deaf-Blind Teacher, Topeka

   We use as a general checklist with SMH children ranging in ages 5-1/2 to 17 years. No seemingly

gradual level of progression from one step or area to another. No set criteria - gives general idea of different areas.

Carol Meredith
Pratt

Used for rating skills in TMR room and also could be used for SMH. Easy to use and base IEP on. Not lengthy.

Carol Nigus
Hiawatha

6. **Denver Developmental Screening Test.**

O.K.

Judy Fillmore
Deaf-Blind Teacher, Topeka

A quick, easy-to-administer basic screening test which gives a general overview of the child's early skills. Better for use with younger children although it can be used with older low-functioning children to give a basic idea of where the child is functioning. It does not give enough information to write a program from, however.

District No. 259
Ancillary Personnel

Too broad. Doesn't allow for physical handicaps. Basically O.K.

Patsy Galligan
SMH Teacher, Pratt

7. **LAP - Learning Accomplishment Profile.**

Easy to administer; for the mildly delayed to severely, although other checklists are needed to get a good picture of the severely involved child; gives goals to work on; simple terms.

Debbie Voth
Early Education, Topeka

8. **Pennsylvania Training Model.**

Good breakdown of levels; gives good concise picture of child's strong and weak areas; easy to give; I like the overall chart that shades in the skills a child can do.

Debbie Voth
Early Education, Topeka

I have used the Pennsylvania Training Model quite a lot. Not only does it help a person write objectives, but it helps a person task-analyze objectives. Also, I have used the page where you really break down the program on what equipment is to be used, the commands, the schedule of reinforcement, etc. This has really helped me in programming.

Carolyn Murphy
Winfield State Hospital

9. **Portage Project.**

Easy to use but leaves a lot of areas uncovered. Makes big jumps developmentally.

Judy Fillmore
Deaf-Blind Teacher, Topeka

Easy to administer; too high for severely involved; is good for activities —— activities can easily be given to parents to follow; can be used as a guide for programs; easy terminology; I especially like infant assessment.

Debbie Voth
Early Education, Topeka

Very long, but very helpful in setting up programs. Geared to trainers who have had very little training.

Patty Meyer
KNI, Topeka

Includes activities for teaching the skill after assessment.

Carol Nigus
Hiawatha

The Portage Project is a very good scale, I think. It has been broken down on activity cards so it is easily understood and can be easily written into an objective.

Carolyn Murphy
Winfield State Hospital

10. **RADEA Materials.**

The RADEA materials provide teachers and paraprofessionals with sequential developmental cards. They are helpful in developing a curriculum in certain areas.

Carolyn Perry
SMH Teacher, Pittsburg

11. **TARC Inventory.**

Good to use on students who are too low for the Camelot.

Judy Fillmore
Deaf-Blind Teacher, Topeka

I like the TARC, but not as a primary assessment tool. It gives a broad overall assessment, but teachers need much more detail than it provides to begin programming. It does not define criteria on the task and the total score you get doesn't tell you much. I like the format of the profile sheet —— gives immediate overview of child at a glance. It's quick and easy to administer.

Patsy Galligan
SMH Teacher, Pratt

Generally good but has to have someone fill it out who has had extensive work with the student. We had to call in the Unit Staff to fill out most of the TARC.

Patty Meyer
KNI, Topeka

We use this inventory regularly at specific intervals during the year. The TARC is straighforward and simple enough to use that it requires little explaining for parents and paraprofessionals to administer and chart independently. It gives an excellent idea of specific area needs of the child and even what to aim for. We use this scale on SMH 5-1/2 to 17 years. The TARC, however, does not give too much information on extremely CP kids. Here again, a true SMH child's assessment needs to be in more detail and broken down into smaller steps of developmental stages. We do use TARC as a curriculum guide. Excellent, easy profile sheet - immediate feedback.

Carol Meredith
Pratt

This scale is adaptable for our SMH in assessing self-help skills at KNI.

E. Coleman
KNI, Topeka

Fairly easily administered. Some discrepancy on items in that not enough choices are available for many of the children. For the children I work with, there is a need for more specific breakdowns on some skills. It is still a good assessment for severely/profoundly retarded. It is not designed for SMH children although some allowances are built into the TARC.

Nancy Callahan
KNI, Topeka

Good for SMH. Easy to use.

Carol Nigus
Hiawatha

a) Easy to assess the skills; b) Appropriate for severe and profound MR - severely emotionally disturbed; c) Reference tool for setting program objectives; d) Some value as a curriculum guide; e) No difficulty in item interpretation; f) Short - 4-1/4 pages; g) Easily understood vocabulary; h) Items have average increment, i.e., gross levels are distinguished.

Patricia Tranel
SMH Teacher, Seneca

12. **TMR Performance Profile.**

This is used in TMR room twice annually as progress cards and to set up IEPs. Lengthy.

Carol Nigus
Hiawatha

13. **Vineland Social Maturity Scale.**

I feel this is totally useless.

Patty Meyer
KNI, Topeka

Not really suitable for non-ambulatory severely involved CPs. Good for vague estimation.

Carol Meredith
Pratt

TITLE (Refer to Table of Contents for complete title.)	PURPOSE			COMPONENTS									PRIMARY POPULATION					POSSIBLE DRAWBACKS				
	To Pinpoint Behaviors, Skills	To Derive Instructional Objectives	As a Curriculum Guide	Motor (G = Gross, F = Fine, P = Perceptual)	Social	Language	Dressing	Feeding	Toileting	Sensory	Cognitive	Other	Trainable Retarded	Severely/Profoundly Retarded	Multiply-Handicapped	Deaf-Blind	Developmentally Pre-School	Lengthy	Expensive	Too High for Most SMH Children	Increments Not Small Enough	May Need Training to Perform
1. AAMD	x				x	x						x	x	x								x
2. Allied Agencies	x			G,F	x	x		x	x		x		x									
3. A manual for the...	x			G,F	x	x	x	x	x		x				x	x		x				
4. APT	x	x	x											x								
5. Balthazar	x	x			x		x	x	x					x				x				x
6. Basic Skills Screening	x	x	x		x	x				x	x	x	x									
7. Bayley Scales	x			x							x						x			x	x	x
8. BCP	x	x											x	x						x	x	
9. Callier-Azusa	x			x	x	x	x	x	x			x			x	x		x				
10. Camelot	x	x			x	x	x	x	x			x	x							x		
11. Denver Developmental	x			F,G	x	x											x			x	x	
12. Developmental Record	x			P	x	x	x	x	x			x					x					
13. Developmental Scales	x			G,F	x	x	x	x	x	x	x					x		x				
14. Education for M-H	x	x		G,F	x	x					x				x							
15. Fairview	x			P	x	x	x	x	x			x	x	x								
16. Koontz	x	x	x	G,F	x	x											x					
17. LAP	x	x	x	G,F	x	x	x	x	x		x		x									
18. LAP - Infants	x	x	x	G,F	x	x	x	x	x		x						x					
19. Maxfield-Buchholz	x			G	x	x	x	x	x			x								x		
20. Memphis	x			G,F	x	x					x						x					
21. Pennsylvania	x	x		G,F	x	x	x	x	x	x	x	x		x								
22. Portage	x	x	x	x	x	x	x	x	x		x						x					
23. RADEA	x	x	x	P		x				x		x					x		x			
24. TARC Inventory	x	x	x	x	x	x	x	x	x				x	x							x	
25. TMR Performance	x				x	x	x	x	x			x	x							x		
26. Vineland	x			G	x	x	x	x	x			x									x	x

COMPUTING DATA

Accuracy (Percent)

1. Percent data represent the number of occurrences of a behavior compared to the number of possible occurrences of that behavior.

2. Percent data are useful in two forms:
   a) Percent of correct responses: *The number of correct responses compared with the total number of responses.*

      Percent Correct -
      $$\frac{\text{number of correct responses}}{\text{total number of responses (correct + error)}}$$

      Example:
      Out of 10 trials, Tim correctly imitated the "ma" sound 5 times.

      $$\text{Percent Correct} - \frac{5}{10} = 50\%$$

   b) Percent of errors: *The number of error responses compared to the total number of responses.*

      Percent Error -
      $$\frac{\text{number of error responses}}{\text{total number of responses (correct + error)}}$$

      If you calculate one formula, you can easily calculate the other: 100 percent correct/percent error

3. Percent data reflect changes in the *accuracy* of a pupil's performance. Percent data do not show changes in fluency (speed).

4. Example of percent data represented on a graph.

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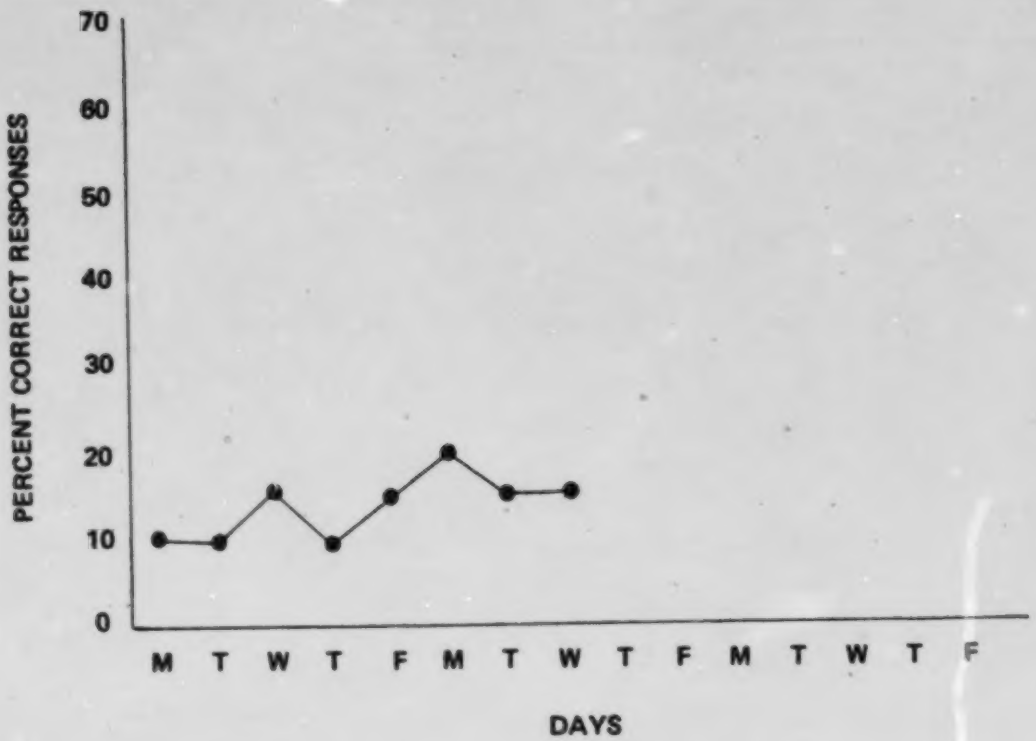
EXAMPLE OF PERCENT DATA DISPLAYED ON A CHART



DURATION DATA

1. Duration Data reflect changes in the amount of time a behavior lasts.

2. Duration Data are collected by noting the amount of time which passes from the beginning of the behavior to the end of the behavior.

3. Example:

   You are trying to increase the amount of time a non-ambulatory student can stand in a standing table.

   You would begin timing the student when placed in the standing table and end when s/he becomes fatigued.

   Let us look at some data:

   Danny - Amount of time standing in standing table.

Mon.	Tue.	Wed.	Thu.	Fri.
15	12	18	20	20

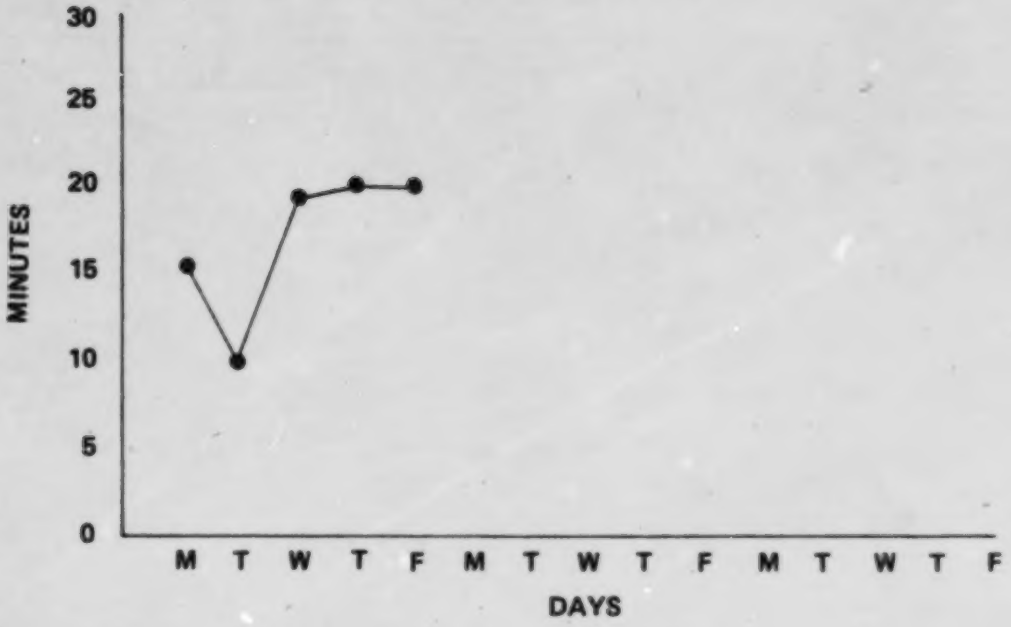
   The data show a slight but steady increase in the amount of time Danny is standing.

4. If you measure the duration of a behavior more than once a day you may average the data.

$$\text{Average Duration} = \frac{\text{Total amount of time}}{\text{No. of trials}}$$

NOTE: Duration data do not provide information on the quantity of response components (the number of items completed) or the quality of the behavior under consideration, (correct responses).

EXAMPLE OF DURATION DATA DISPLAYED ON A CHART



PROFICIENCY (RATE) DATA

Handout No. 8

1. Rate or frequency data are considered the most sensitive type of measurement used in the classroom.

   Rate data reflect *accuracy* of responding

   and

   fluency or speed of responding

2. The following formulas are used to calculate *rate* of responding:

$$\text{Correct Rate} = \frac{\text{number of correct responses}}{\text{time}}$$

$$\text{Error Rate} = \frac{\text{number of error responses}}{\text{time}}$$

3. Examples:
   a) Jamie took four independent steps within 10 min. on Monday.

$$\text{Correct Rate} = \frac{4 \text{ steps}}{10 \text{ min.}} = .4 \text{ correct per min.}$$

   The remaining data for Jamie during one week was:

   Tuesday: 6 steps in 15 min.
   Wednesday: 7 steps in 10 min.
   Thursday: 5 steps in 10 min.
   Friday: 9 steps in 15 min.

   Now compute the rate correct for each of the data above:

Tuesday:
Wednesday:
Thursday:
Friday:

   b) When presented with the task of matching objects, Andy demonstrated the following data:

Monday:
Correct - 3
Error - 7
Time - 20 min.

$\text{Correct} - \frac{3}{20} = .15$ per min.

$\text{Error} - \frac{7}{20} = .35$ per min.

Tuesday:
Correct - 2
Error - 8
Time - 15 min.

$\text{Correct} - \frac{2}{15} = .13$ per min.

$\text{Error} - \frac{8}{15} = .53$ per min.

Wednesday:
Correct - 1
Error - 9
Time - 10 min.

Correct - $\frac{1}{10}$ = .1 per min.

Error - $\frac{9}{10}$ = .9 per min.

When charted on the *Standard Behavior Chart* the data shows that as the amount of time to complete the task decreases, the correct responses decrease and the error responses increase. The data indicate to the teacher that Andy should be encouraged to slow his rate of responding to the task.

NOTE:

Rate data adds the second dimension of *time* to the information which we can obtain from percent.

CUMULATIVE DATA

Handout No. 9

1. Cumulative data represent the total number of responses (they may be correct or error responses) a pupil has exhibited over the number of sessions in which the responses occurred.

   Cumulative data reflect the *accumulated* number of behaviors or responses exhibited over time (sessions or hours).

2. Cumulative data are obtained by successively adding the number of times a behavior or response occurs or the number of correct or error responses exhibited by the pupil during each session and/or from day to day.

Example No. 1: Tony hit himself Day One

Morning Session - 3 times
Lunch Session - 5 times
Afternoon Session - 3 times

Cumulative data = 11 times on day one

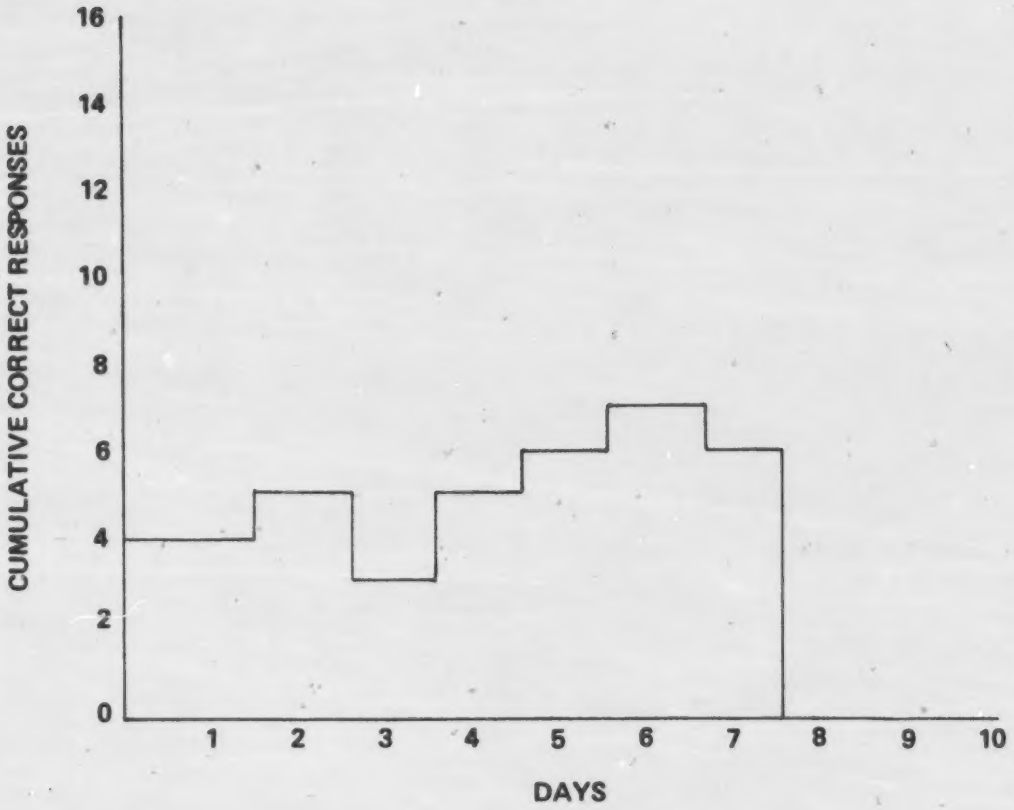
Example No. 2: Andy verbalized for food (correct response)

Day One
Session No. 1 - 5 correct
Session No. 2 - 3 correct
Session No. 3 - 4 correct
12 correct

Day Two
Session No. 1 - 4 correct
Session No. 2 - 6 correct
Session No. 3 - 6 correct
16 correct

NOTE: Cumulative data are appropriate in the classroom when major concern focuses on accumulation of responses over a period of time. Actual changes in accuracy are not reflected.

EXAMPLES OF CUMULATIVE DATA DISPLAYED ON A CHART



LATENCY DATA

Handout No. 10

1. Latency data detect changes in the time between the presentation of a cue and the pupil's response to that cue.

2. Example:

   You are trying to increase the amount of time it takes for Shelly to begin chewing after she is presented with a solid food.

   You would note the amount of time between placing the solid food in her mouth and the point at which she begins to chew.

   In order to make the best use of this type of data you would average the total amount of time between cues and responses for the entire session.

   $$\text{Latency Average} = \frac{\text{total amount of time between cues and responses}}{\text{total number of times measures were recorded. (total number of trials)}}$$

   Let us look at some data:

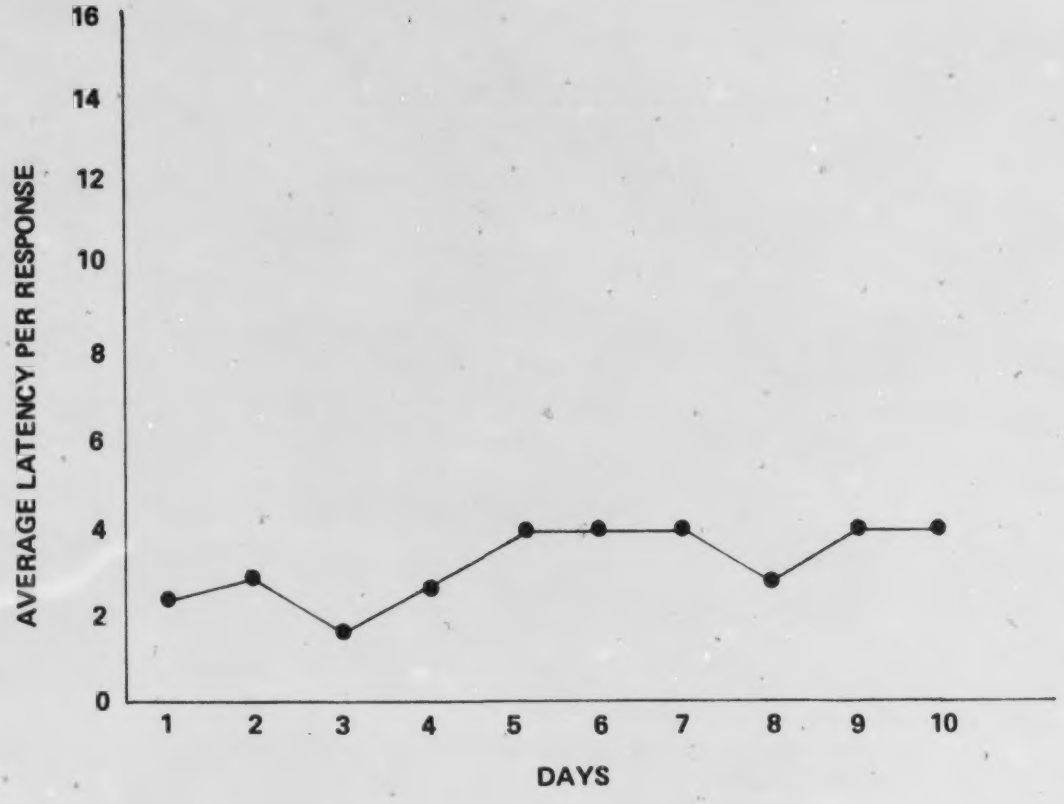
   Monday Breakfast:
   Trial 1 - 3 min. time between cue/response
   Trial 2 - 2 min.
   Trial 3 - 2 min.
   Trial 4 - 3 min.
   Trial 5 - 3 min.
   13 min. total amount of time

   $$\text{Latency Average} = \frac{\text{13 min. total amount of time}}{\text{5 trials}} = \text{2.6 average}$$

   For Monday Breakfast, Shelly averaged 2.6 min. between presentation of solid food and point of chewing.

NOTE: Latency data do *not* provide information on the quantity or quality of behaviors which occur during measurement.

EXAMPLE OF AVERAGE LATENCY DATA DISPLAYED ON A CHART



EXAMPLES OF DEFINING DIMENSIONS OF BEHAVIOR

1. IF YOUR GOAL IS TO TEACH THE STUDENT TO DISTINGUISH BETWEEN SHAPES, YOUR CRITICAL DIMENSION WILL BE ACCURACY. ONCE S/HE HAS ACHIEVED THE ACCURACY YOUR EMPHASIS WOULD SHIFT TO FLUENCY (SPEED).

2. IF YOU WANT TO KNOW HOW MANY CORRECT RESPONSES A STUDENT IS MAKING DURING A SESSION AND HOW QUICKLY S/HE PERFORMS THE CORRECT RESPONSES YOUR CRITICAL DIMENSION WILL BE ACCURACY AND FLUENCY OR PROFICIENCY.

3. IF YOU WANT TO KNOW HOW LONG A BEHAVIOR OCCURS OVER A PERIOD OF TIME YOUR CRITICAL DIMENSION WILL BE DURATION.

4. IF YOU WANT TO KNOW HOW LONG IT TAKES FOR A STUDENT TO BEGIN A BEHAVIOR AFTER THE CUE HAS BEEN GIVEN THEN YOUR CRITICAL DIMENSION WILL BE LATENCY.

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Reuben Altman, Department Editor
Edward L. Meyen, Department Editor

RESEARCH IMPLICATIONS

The following report by Hanson and Bellamy describes and supports the use of a continuous measurement strategy for assessing treatment effects and facilitating intervention efforts. In essence they operationalize a criterion as opposed to a normative based evaluation technique and simultaneously highlight a number of advantages underlying the approach. While the focus of this particular paper is a Down's Syndrome infant population with parents serving as the intervention agents, their procedure and discussion are equally applicable to any educational program and/or target population in which anticipated gains are minimal in nature. Intrinsic to a continuous measurement strategy are the benefits rarely accrued when assessment entails only periodic appraisal with instruments which may or may not be directly related to the target behavior or evaluation which may or may not be sensitive to the small increments in performance we expect with very young or very severely handicapped subjects. In contrast, evaluation here is itself an integral component of the instructional procedure. Further, this paper bears implications for the practitioner in education as well as the researcher, both of whom are necessarily mindful of the need to document change in performance as a function of intervention. R. A. and E. L. M.

CONTINUOUS MEASUREMENT OF PROGRESS IN INFANT INTERVENTION PROGRAMS

Marci J. Hanson
G. Thomas Bellamy

Several demonstration and research programs have been conducted during the last few years to accelerate the development of infants at risk for developmental disabilities (Hayden & Dmitriev, 1975; Ramey & Smith, Note 1). In these programs systematic treatment has typically involved both professional workers and parents, and treatment effects have been evaluated by periodically administering standardized assessment instruments. By accelerating the development of skills measured by these instruments, the programs have done much to argue the case for early intervention in special education. As a result, service programs for handicapped infants are increasingly available.

As effective as standardized instruments were in demonstrating the possible impact of early intervention, it seems unlikely that they will serve the current generation of service programs as well. In these programs decisions must be made which require data not provided by standardized instruments. For example, a parent or treatment consultant must decide whether specific intervention techniques are having their intended effect. Similarly, they must determine whether a specific set of steps is in fact leading toward a defined objective. For these decisions, data are needed which are more immediate and more specifically related to the procedures used.

The purpose of this paper is to argue for the use of measurement systems in which infants' daily performance of targeted skills is recorded. The discussion is intended specifically for the many professionals and paraprofessionals who are now charged with implementing infant intervention programs, and whose procedures involve parents in the treatment program. A simple method of continuous measurement will be described along with the benefits which accrue with its use. Discussion and illustration will center on experiences from a parent implemented research program for Down's Syndrome infants at the University of Oregon, in which a consultant assists parents in designing individual treatments.

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Measures--Selection and Uses

What kinds of continuous measure are useful? The measurement system described here presupposes that specific developmental objectives have been defined for the infant, steps toward these objectives specified, and criterion levels of performance defined for progression through each step. As treatment procedures are implemented, infant responses to defined cues are recorded so that progress toward the criterion can be monitored. Progress toward different kinds of criteria is measured differently. For example, one step in an independent sitting program might be the child sitting supported by his/her arms with hands on the floor in front of him or her. The performance criterion for progression to a next step involving less support could be the ability to maintain that posture for an average of 60 seconds on 10 training trials for 3 days. Continuous measures of performance would thus involve the amount of time, or *duration*, the infant sat with the specified support.

A somewhat different measurement strategy is necessary for other criteria. In a crawling program, it could be useful to record the percent of correct responses to a defined cue, e.g. the percentage of trials on which the child responds correctly and crawls the criterion distance of 12 inches when given a foot prompt. After the infant begins to perform a defined behavior, useful measures often focus on the frequency with which it is performed or on response latency, the time between cue presentation and the infant's response.

Whichever measure is appropriate for the criterion, several benefits accrue when continuous measures of infant behaviors are used in programs in which parents and professionals are jointly involved. Although these benefits have occasioned some comment in other reports they are discussed specifically here to facilitate the work of parent trainers or treatment consultants in infant intervention programs.

Continuous measurement facilitates individual programming. For most treatment objectives in infant development, the parent and consultant may choose among a variety of possible task analyses and intervention approaches. That is, several possible sequences of steps often exist which could lead to the objective. After a particular sequence is selected, several treatment approaches are also possible to improve performance on each step. Continuous measurement of infant progress provides a check on such decisions about sequencing and treatment, insuring that they are appropriate to the individual infant.

To illustrate, a convenient systemm used in the University of Oregon program is an adaptation of the data recording method of Saunders and Koplik (1975). In one program, parents were asked to perform 10 trials per day on a crawling program in which the infant was expected to crawl independently, foot prompts having been faded out. Parents recorded infant performance by placing a "+" over the number o each trial on which the infant responded correctly and a "-" over the number of each incorrect trial (See Figure 1). The number of correct responses was then counted and the total circled, indicating the frequency of correct responses over trials in one day. Circles on subsequent days were then connected, forming a graphic representation of the child's progress through the program. As can be seen in Figure 1, the infant crawled the criterion distance of 6 inches on 50 percent of the trials the first day, 70 percent the second, 80 percent on the third and fourth, and 90 percent on the fifth day. The parent then moved to the next step in the program which required the child to crawl 8 inches. Modifications of this system can also be used to gather other kinds of data, such as frequency or duration counts.

This system gives the parents and treatment consultant a quick overview of progress without demanding much additional time for either data collection or graphing. With this overview, a number of treatment decisions can be made to individualize programming. When the data show lack of progress on a given step, the treatment procedures (reinforcers, cues, time of day of administration, etc.) might be changed. If progress is not then noted, attention could be turned to the sequence of steps. "Branching" or adding a number of smaller steps may then facilitate progress.

Continuous measurement facilitates communication and increases parents' role in program decision making. The measurement system described also serves as a system of communication between parents and the treatment consultant. With it communication is focused on the actual performance of the child in prescribed activities, and thus the effectiveness of the consultant's suggestions can be communicated clearly during periodic visits.

Perhaps one of the most important products of the daily measurement system is its effect on the relative roles of parent and treatment consultant. With objective measures of their infant's progress parents can become informed consumers of consultant services. The ability to communicate objectively the exact result of previous treatment suggestions allows the parent to play a major role in the infant program. Further, by using a daily data system, a parent can readily see when a program change should occur. Thus, parents can advance their child through steps in a program at a rate appropriate to each child, without waiting for professional consultation to proceed in the program Therefore, the data serve to increase the role of the parent in the overall decision making for individual program planning.

Continuous measurement allows for analysis of treatment effects. Persons responsible for infant intervention programs often have considerable difficulty in establishing the benefits of their program. Rapid behavioral changes occur in infancy simply as a result of growth and maturation. Unless some behavioral changes can be specifically attributed to the intervention procedures, the value of the program is difficult to establish. For this reason, measurement designs which provide evidence of a functional relationship between treatment procedures and behavioral changes can be quite useful. Two such designs seem particularly applicable to infant intervention programs. Each can be used with little modification of the measurement strategy described earlier.

In one of these, the multiple baseline design (Hall, Cristler, Cranston, & Tucker, 1970), baselines are established on two or more independent behaviors. Intervention is then begun on each, one at a time. Evidence for a functional relationship between the intervention procedures and behavior changes is provided if changes do occur in each behavior when and only when the intervention is implemented. Variations of the design include establishing baselines on several behaviors for the same individual, on the same behavior of several individuals, and on the same behavior across several situations

The use of a multiple baseline design to evaluate one treatment used in the University of Oregon program is illustrated in Figure 2. Baselines were obtained on two behaviors of one 5 1/2 month old Down's Syndrome infant: standing by furniture (defined as child standing, bearing weight on feet holding on to furniture for support) and independent sitting (defined as child sitting in an erect position on flat surface with no support). Performance on both behaviors was recorded daily on 10 trials which occurred throughout the day. During Days 1 through 5 (Baseline) the infant averaged less than 7 seconds for standing by furniture and did not exhibit independent sitting on any opportunity. Treatment was begun on standing by furniture on Day 6, while baseline was continued for sitting. Treatment involved the parent providing presumed social and material reinforcers for approximations of the behavior. By Day 25 the infant was standing by furniture for an average of approximately 60 seconds, which was the defined criterion for completion of that training program. Periodic assessments of standing by furniture were taken on subsequent days, showing that the infant was able to stand for more than 60 seconds.

Independent sitting did not occur until treatment was begun on Day 27. At that point the average number of seconds the infant could sit independently began to increase until the infant was able to sit independently for an average of nearly 60 seconds on Days 40-45. Again treatment involved the parent providing presumed social and material reinforcers for approximations of the behavior. These two behaviors, standing by furniture and independent sitting, increased to criterion levels when and only when intervention was begun. Thus, the design argues strongly for the interpretation that infant gains were functionally related to the training procedures employed.

A second convenient design which can be used to evaluate the effects of training procedures is the changing criterion design. In this design behavioral criteria for consequation are set and sequentially changed when each criterion is met. This design, like the multiple baseline design, supports the interpretation that infant behavior changes are functionally linked to intervention procedures.

The use of a changing criterion design to evaluate a self-feeding program is illustrated in Figure 3. In the program an 18 month old infant was taught to feed herself independently with a spoon in the following sequence of steps: (a) grasps spoon, (b) removes food from spoon in mouth, (c) brings spoon to mouth, (d) scoops food with spoon, (e) returns spoon to bowl. Infant performance on each of these steps was assessed during one daily probe trial in which the infant was given the opportunity to demonstrate the highest level of independence on each step without teaching. Levels of independence

were recorded using the following five categories: (a) performs behavior with a full hand prompt from parent, (b) performs behavior with a wrist prompt from parent, (c) performs behavior with a forearm prompt from parent, (d) performs behavior with an elbow guide from parent, (e) performs behavior independently with no prompts from parent.

Baseline was established on four probe trials on Day 1. As can be seen from Figure 3, the infant was able to grasp the spoon and remove the food from the spoon independently. In addition, she performed bringing spoon to mouth (Step 3) with a full hand pompt, wrist prompt, and forearm prompt 100 percent of the time. However, with prompting faded to only an elbow guide, she accomplished the behavior on only 25 percent of the opportunities given. Therefore, treatment was begun on Step 3 using an elbow guide for training. Treatment was limited to one step and independence level each day and involved the parents providing presumed reinforcing consequences for the behavior on each of 10 daily training trials. Treatment was advanced to the next level in the series when a criterion of 80 percent or more correct responses was reached for 2 successive days. When probe trials showed a correct performance on 80 percent or more of the probes on a given level training on that level was skipped and the next level in the series was taught. For example, on Day 17, several steps were skipped and the program advanced to the elbow guide level for Step 5 because probes indicated the child had advanced to this level. Her rapid progress on the final Step 5 may have been due to the effect of similar training on the previous steps. Levels reached on probes are indicated in Figure 3 by the shaded areas: data points from training are listed numerically by the percent of correct responses per day (example: 70).

Figure 3 illustrates that the child's performance during both training and probe situations specifically reflects the step on which training was implemented. As can be seen, criterion on most steps was reached only when training was implemented. This increases the confidence of the treatment consultant that a functional relationship exists between training procedures and infant skill development.

Discussion

This paper has argued that periodic administration of standardized assessment instruments will provide insufficient data for making program decisions in the many infant intervention programs which are now available. Instead, a method of continuous measurement has been proposed, which utilizes a recording format suggested by Saunders and Koplik (1975). In this system, infant responses to specific treatment cues or situations are recorded daily by noting their frequency, duration, latency, or percent correct.

Several benefits accrue when such a data system is used. It is possible for treatment programs to be individualized for each infant; parents participate more completely in the decision making concerned with their child's program; and continuous measurement can facilitate the evaluation of program effectiveness by identifying functional relationships between procedures and infant behavioral changes. Convenient measurement systems thus can be employed in a parent program with little disruption to ongoing training practices and no significant commitment of additional time by parents or professional treatment consultants.

FIGURE 1. Sample data collection sheet.

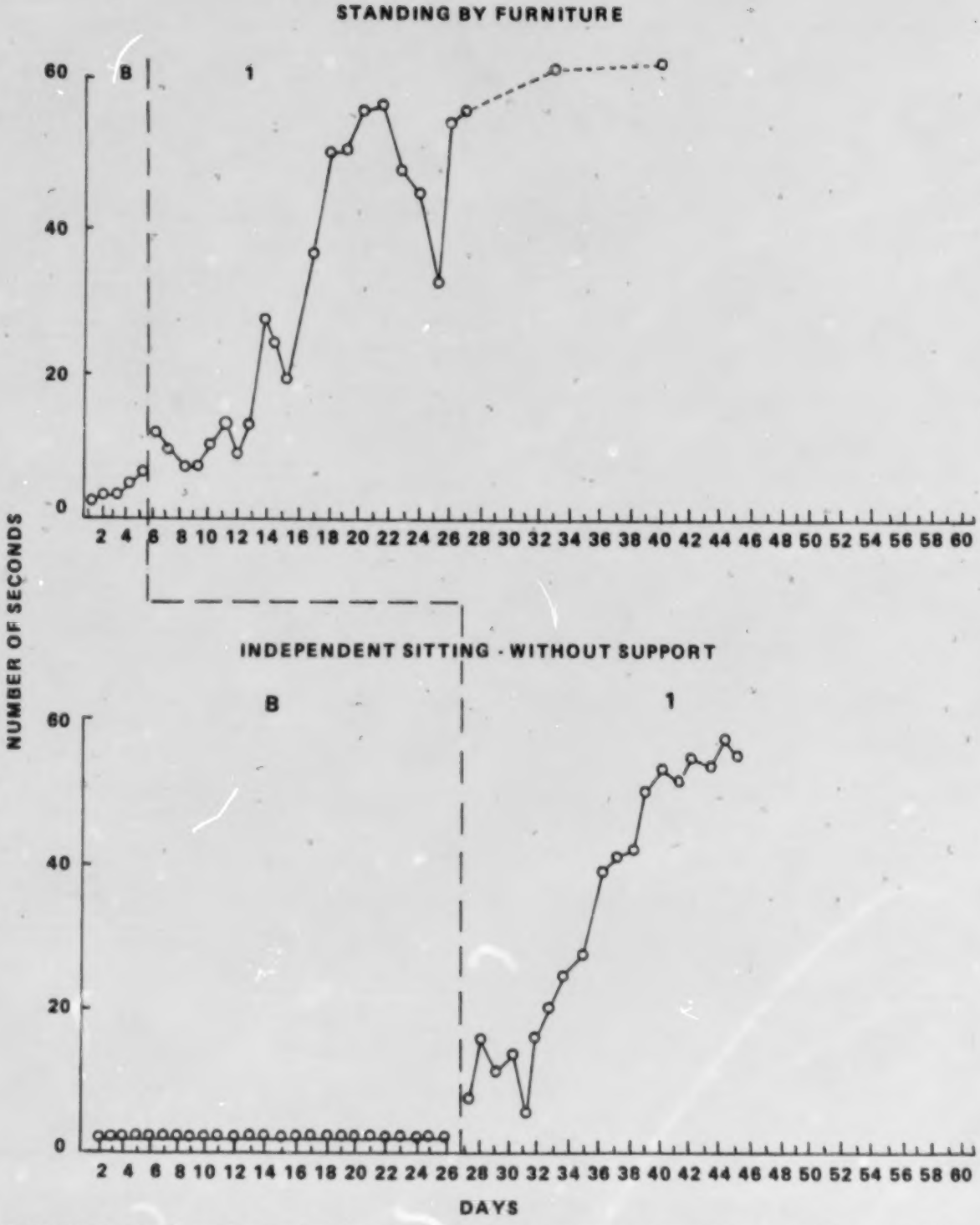

FIGURE 2. Number of seconds infant maintained the positions of standing by furniture and sitting independently during baseline and intervention conditions.

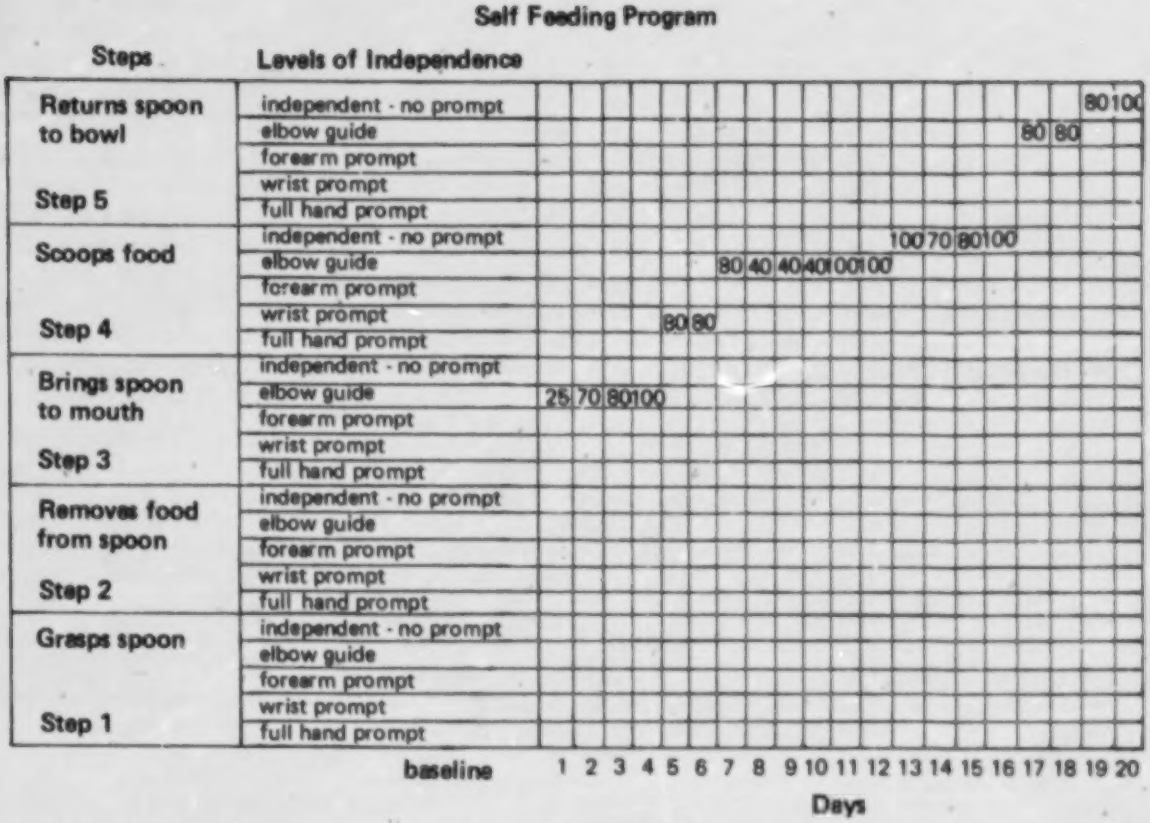

Figure 3. Levels of independence of an infant on steps of a self feeding program. Numerals indicate the percent of correct responses on 10 training trials for the level and step being taught on each day. Shaded areas represent correct responses on nonconsequated probe trials.

References

Hall, R. V., Cristler, C., Cranston, S. S., & Tucker, B. Teachers and parents as researchers using multiple baseline designs. Journal of Applied Behavior Analysis, 1970, Vol. 3, pp. 247-255.

Hayden, A. H., & Dmitriev, V. The multi-disciplinary preschool program for Down's Syndrome children at the University of Washington Model Preschool Center. In B. Z. Friedlander, G. M. Sterritt, & G. E. Kirk (Eds.), Exceptional infant: Assessment and intervention (Vol. 3). New York: Bruner/Mazel, 1975.

Saunders, R. R., & Koplik, K. A multi-purpose data sheet for recording and graphing in the classroom. American Association for the Education of the Severely/Profoundly Handicapped Review, 1975, Vol. 1, pp. 1-8.

Reference Note

1. *Ramey, C. J., & Smith, B. J. Learning and intelligence in disadvantaged infants: Effects of early intervention. Paper presented at the annual meeting of The Council for Exceptional Children, Chicago, Illinois, April 1976.*

CRITERION OF ULTIMATE FUNCTIONING

Lou Brown, John Nietupski, and Susan Hamre-Nietupski

Key Ideas

For severely handicapped citizens to ultimately function as productively and independently as possible in integrated adult environments, the services provided to them as students must be longitudinal and continuous, as opposed to short term or episodic.

The least restrictive environment for severely handicapped students, such as placement in self contained classes in regular community based public schools, fosters the development of the skills necessary to perform in a heterogeneous society.

The overuse of one to one instruction, homogeneous groupings, and repeated practice strategies probably prevent many severely handicapped persons from acquiring the skills, values, and attitudes necessary to interact effectively in a variety of settings and with a variety of people.

Artificial instructional materials and settings do not allow severely handicapped students to solve real life problems or provide them with the skills needed for practical functions, as much as do natural and realistic settings, tasks, and materials.

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WHAT WE BELIEVE

Not too long ago there were few, if any, educational services for mildly retarded or mildly handicapped students in American public school systems. Self contained schools and self contained classes within regular schools were generated and proliferated soon after. For years self contained schools and self contained classes within regular schools were considered the most efficacious models in which to provide educational services to mildly handicapped students.

In 1968 Dunn published his now famous article, "Special Education for the Mildly Retarded——Is Much of It Justifiable?" There Dunn crystalized the judgments, suspicions, and feelings of many persons in and out of special education——namely, that the placement of mildly handicapped students into self contained schools and self contained classes was unduly restricting their general development and not preparing them to function adaptively in complex, integrated, community based postschool environments.

In the past the predominant educational service delivery models generated for the majority of severely handicapped students in this country were (a) placement in large self contained residential facilities (institutions), (b) placement in self contained schools, (c) maintenance at home, and (d) the use of private facilities such as churches or facilities supported bv private associations concerned with providing services for retarded citizens.

Within the past 5 years, due to encouraging judicial, executive, and legislative reactions to the advocacy activities of many enlightened parents and other persons and groups, formerly rejected severely handicapped students are now being served in community based public schools. Unfortunately, it seems that the overwhelming majority of severely handicapped students now in public schools are being served in self contained facilities. Self contained facilities will ultimately be rejected for the same reasons that self contained programs within regular schools for mildly handicapped students have been and are being rejected.

There is no doubt that the spirit of the times requires that severely handicapped students be allowed to grow within the least restrictive developmental environments. Placement in large multipurpose institutions, sustained maintenance at home, and/or sustained placement in self contained classes within segregated schools is generally restrictive. The community must create other more educationally tenable developmental environments.

The spirit of the times requires that severely handicapped students be allowed to grow within the least restrictive developmental environments.

Severely handicapped students should be placed in self contained classes in regular schools. Severely handicapped students should eat, recreate, assemble, travel, ambulate or be ambulated, play, read, study, and learn with students of all developmental functioning levels. Why? Because severely handicapped students will no longer be locked up in isolated dehumanizing institutions; they will no longer be hidden in homes; they will no longer be rejected from public schools; they will no longer be sheltered from society. They have the right to be visible, functioning citizens integrated into the everyday life of complex public communities.

Severely handicapped students have the right to be visible functioning citizens integrated into the everyday life of complex public communities.

THE LOGIC OF HOMOGENEITY

One of the most pervasive, and in our view questionable, philosophic assumptions in our society is that homogeneity is a *generally* positive objective that should be approximated if not realized. This general quest to cluster according to similarities, to stratify on the basis of differences, and to realize uniform compositions is referred to here as the logic of homogeneity.

One of the most pervasive, and in our view questionable, philosophic assumptions in our society is that homogeneity is a generally positive objective.

Discernible manifestations of the logic of homogeneity are prevalent in many aspects of our society. Predetermined efforts have been made to group according to skin color, family heritage, verbal accent, sex, religious affiliation, military rank, professional or paraprofessional status, wealth, and academic degree, to name only a few. These manifestations are often based on such assumptions as (a) people do better and are happier if they are with their own kind, (b) people who are different than us do not like us, (c) our cultures are too different, (d) if God wanted us to be together, She would have arranged it, and (e) overcoming the communication problem is not worth the effort.

In education generally there have been many manifestations of the logic of homogeneity. For example, students have been "tracked" within and between schools and classes, males and females have been stratified in "health" and physical education classes, and parochial schools and athletic leagues are prevalent.

In special education, the logic of homogeneity abounds to the point of absurdity. Special educators have established self contained classes, self contained schools, groupings for the orthopedically handicapped, the blind, the mildly retarded, the emotionally disturbed, and the trainable mentally retarded, and on and on ad infinitum. By affording credence to the presumed positive properties of the logic of homogeneity within educational systems, educators have systematically, although inadvertently, impeded many handicapped and nonhandicapped students from acquiring the skills, values, and attitudes necessary to function in heterogeneous multifaceted and interpersonally complex adult environments.

Educators have systematically, although inadvertently, impeded many handicapped and non-handicapped students from acquiring the skills, values, and attitudes necessary to function in heterogeneous and complex environments.

Many persons concerned with providing developmental services to mildly handicapped students have rejected, or are now in the process of rejecting, the basic tenets of the logic of homogeneity. Those persons concerned with providing the best possible educational services to *severely* handicapped students should do the same. However, it should be noted and emphasized that certain kinds of homogeneous groupings in selected settings for selected purposes may be educationally, medically, and socially tenable. That is, to reject the logic of homogeneity completely is probably as irrational as to absorb it completely. The point is that the logic of homogeneity as it relates to the provision of educational services for severely handicapped students is *generally negative*. Homogeneity must be scrutinized carefully and rejected in favor of heterogeneity whenever possible.

THE LOGIC OF HETEROGENEITY

The logic of heterogeneity leads to the position that persons of differences or dissimilarities in almost all aspects of existence should interact. Most postschool community based domestic, vocational, and recreational environments are fundamentally heterogeneous in nature. If severely handicapped students are to be expected to function effectively in heterogeneous community environments, as many preceding developmental experiences as possible should represent that heterogeneity. Every time educators make a decision affecting the longitudinal development of a severely handicapped student, they must seek manifestations of the logic of heterogeneity.

If severely handicapped students are to be expected to function effectively in heterogeneous community environments, as many preceding developmental experiences as possible should represent that heterogeneity.

If educators had ascribed to the logic of heterogeneity in the past, they would not now be confronted with ways in which to dismantle "state schools," self contained public schools, and other forms of segregated instructional settings. At this time it appears that one of the

most realistic manifestations of the logic of heterogeneity would be to encourage comprehensive and longitudinal involvement with non-handicapped persons in a diversity of constantly changing community environments.

DEGREES OF INSTRUCTIONAL INFERENCE

Most teachers assume varying degrees of instructional inference when relating to students, regardless of their functioning levels. Generally, the less handicapped the student, the higher the degree of inference regarding the performance of that student. For example, teachers of nonhandicapped students often teach the rational counting of wooden pegs. After a student has performed at criterion on this task, it is usually inferred that the student can also rationally count eating utensils, money, and completed work units. This, of course, represents a relatively high degree of instructional inference. Implicit in relatively high degrees of instructional inference is the assumption that from specific training on circumscribed or core tasks, students will abstract the *critical factors,* strategies, rules, and concepts from the training environment, and apply them in new and varied environments.

Teachers of severely handicapped students can rarely, if ever, infer that because a student performs a particular skill in an artificial setting, he or she can also perform that skill in other more natural settings.

At this stage in the evolution of instructional technology, critical factor strategies can be afforded little educational credence. That is, to our knowledge, it has not been empirically demonstrated that the teaching of a few critical skills has resulted in substantial increases in the general developmental functioning levels of many severely handicapped students. Thus, teachers of severely handicapped students can rarely, if ever, infer that because a student performs a particular skill in an artificial setting he or she can also perform that skill in other more natural settings.

Unfortunately, it may be necessary to teach severely handicapped students all the skills, concepts, actions, and responses required for adaptive performance in all the postschool environments to which they will be exposed. Such an instructional possibility is referred to here as a *zero degree inference strategy.* That is, no inferences are made that training to a criterion on any task in one situation will result in criterion performance in similar but different situations requiring similar or slightly different actions. Each time a situation changes for a severely handicapped student, it will be necessary to empirically verify that he or she can perform the skills required by that new situation.

Occasionally it has been demonstrated that severely handicapped students can acquire relatively complex skills. However, rarely have severely handicapped students, taught to perform complex skills in artificial instructional settings, been able to perform relevant versions of those skills in natural community settings. Thus, until such time that critical factor strategies are demonstrated empirically effective in developing the skills necessary for severely handicapped students to perform a variety of skills in a variety of community settings, with a variety of persons, language cues, and materials; it appears that approximations of zero degree inference strategies offer higher probabilities that students will be able to perform acceptably in less restrictive environments as adults.

EDUCATIONAL SERVICE CHARACTERISTICS

As large numbers of severely handicapped students enter into less and less restricting community environments, the current performance differences between them and their nonhandicapped age peers will be quite dramatic. Initially such dramatic differences will engender fear, frustration, rejection, and hopelessness in many sincere and well meaning individuals, both in and out of the human services movement.

In time, the initial negative emotional reactions will abate and the collective consciousness and energies of the community will be redirected toward providing the best possible developmental services.

In some school districts attempts will be made to maintain as much physical distance as possible between severely handicapped and non-handicapped citizens: Old school buildings will be opened or renovated and *only* severely handicapped students will be assigned to them; new school buildings will be constructed under the guise that the students of concern are in need of "special A, B, or C." However, as educators realized when they attempted to provide specialized services to mildly handicapped students, segregating procedures impede achievable approximations of human potential.

At least one major question should be addressed: Over long periods of educational time, what are some of the fundamental characteristics of the most creditable educational services based upon the best available information? The position taken here is that in addition to the constant quest to realize the criterion of ultimate functioning and to manifest the logic of heterogeneity, there are at least three additional factors that must be considered basic characteristics of educational services for severely handicapped students.

Specialized educational services should be provided as soon after birth as possible.

First, specialized educational services should be provided as soon after birth as possible. The reasons for early educational intervention as it relates to the involvement, acceptance, and training of parents, and longitudinal human development are obvious. The point of emphasis here is that if any child is identified as, or is at risk of becoming, severely handicapped on Monday and a public school contact is not made until Wednesday, it is one day too late.

Second, educational services for severely handicapped students must be comprehensive and coordinated toward educational development. Severely handicapped students manifest a variety of developmental delays and require at least the expertise of physical, occupational, language, and medical therapists, persons capable of providing visual and auditory assessment and habilitation, as well as the general resources of the educational community. On the other hand, it is also obvious that, although the multidisciplinary team is a "sound good" phrase, such a concept rarely produces coordinated and empirically verified educational outcomes. Indeed, a challenge educators must confront and meet is the design of systems to both articulate and harvest the contributions of varied persons and disciplines and filter the persons and/or disciplines that detract from the development of empirically tenable educational services.

Although multidisciplinary team is a "sound good" phrase, such a concept rarely produces coordinated and empirically verified educational outcomes.

Services for severely handicapped students must be longitudinal as opposed to episodic.

Third, the services that are provided for severely handicapped students must be longitudinal as opposed to episodic. An episodic intervention refers to the brief involvement of a professional in the developmental lifestyle of an individual. There are thousands of instances when episodic interventions are empirically tenable, particularly when non-handicapped persons are the recipients of such interventions. For example, if an individual contracts an infection, he or she can spend a few minutes with a physician, receive an injection and the problem is solved. If a muscle around an eye contracts, one can visit an optometrist and after a brief examination and a change of glasses, the problem is solved. The availability and functional validity of episodic interventions are perhaps some of the most positive aspects of this society.

The general functional *invalidity* of episodic interventions is a critical source of frustration for parents and professionals who relate to severely handicapped students. Parents can take their severely handicapped child for a vision examination, but in fact the professional may not be able to provide a valid diagnosis and an empirically verifiable prescription. As a result, many severely handicapped students function with uncorrected visual problems. A longitudinal approach to the problem, although requiring more time and money, obviously is warranted. The sustained coordination and ingenuity of *many* persons will be required before the most effective visual prescription can be empirically determined.

A similar situation exists when parents take their severely handicapped children to the standard multidisciplinary team of experts. About 2,000 professionals representing 1,400 disciplines at an enormous cost spend from 30 to 37 minutes each with a severely handicapped student. After this series of episodic interventions, programmatic recommendations are then made to parents and teachers. Generally, few followup efforts are attempted to ascertain the empirical value of the recommendations and/or to suggest changes in programming based on the progress of the child. The educational outcomes are unfortunately predictable.

THE CRITERION OF ULTIMATE FUNCTIONING

Large multifailure residential facilities and other segregated facilities for adult severely handicapped citizens will be replaced by complex, integrated, developmentally facilitative community models. Thousands of severely handicapped citizens will attend church, shop, wait in the offices of physicians, ride public buses, wash dishes, attend movies, use restrooms, cross streets, and cheer at football games with less handicapped and nonhandicapped citizens. If severely handicapped adult citizens are to function effectively in heterogeneous community environments, both handicapped and nonhandicapped citizens will require longitudinal and comprehensive exposure to one another. Such exposure will enhance the probability that the skills, attitudes, and values so necessary for tolerance, understanding, and absorption will be realized.

Large multifailure residential facilities will be replaced by complex, integrated, developmentally facilitative community models.

If severely handicapped adults are to function effectively in a heterogeneous community, both handicapped and nonhandicapped citizens will require longitudinal and comprehensive exposure to one another.

The criterion of ultimate functioning refers to the ever changing, expanding, localized, and personalized cluster of factors that each persom must possess in order to function as productively and independently as possible in socially, vocationally, and domestically integrated adult community environments. Since severely handicapped citizens will ultimately function in settings which contain less handicapped and nonhandicapped citizens, the majority of the developmental environments to which most severely handicapped citizens are now exposed will require substantial changes. Longitudinal segregation, whether manifested in residential institutions or self contained schools, homes or classes will not culminate in the realization of the criterion of ultimate functioning.

The position taken here is that the requirements of the criterion of ultimate functioning should be the standards by which educational activities are judged as they relate to severely handicapped students. Any activity, however episodic or apparently inconsequential, must be related to the criterion of ultimate functioning, or that activity should be terminated. Thus prior to the initiation of any interaction with the severely handicapped students we must at least ask the following questions:

Any activity, however episodic or apparently inconsequential, must be related to the criterion of ultimate functioning, or that activity should be terminated.

1. Why should we engage in this activity?
2. Is this activity necessary to prepare students to ultimately function in complex heterogeneous community settings?
3. Could students function as adults if they did not acquire the skill?
4. Is there a different activity that will allow students to approximate realization of the criterion of ultimate functioning more quickly and more efficiently?
5. Will this activity impede, restrict, or reduce the probability that students will ultimately function in community settings?
6. Are the skills, materials, tasks, and criteria of concern similar to those encountered in adult life?

Many educational assumptions and practices, although appearing educationally sound, actually interfere with the realization of the criterion of ultimate functioning.

In the following pages attempts will be made to communicate the idea that many educational assumptions and practices currently in operation or in proposal, although appearing educationally sound and expedient, actually interfere with the realization of the criterion of ultimate functioning.

THE VALUE OF CERTAIN INSTRUCTIONAL PRACTICES

For the past several years we have made attempts to develop instructional programs for severely handicapped students in community based public school zero exclusion educational settings. In addition, we have had the opportunity to visit many educational programs around the nation in an attempt to both provide and receive technical assistance. As a result of our experiences we have modified many of our attitudes, techniques, assumptions, and instructional practices as they relate to educational strategies that are typically used or advocated for use with severely handicapped students.

As we tried to relate many of our instructional practices to the standards of the criterion of ultimate functioning, many inadequacies and failures surfaced. In this section we will describe some of the instructional practices we formerly recommended for general use, some of the difficulties we have encountered with those practices, and some of the adaptations we are currently entertaining.

ONE TO ONE INSTRUCTION

It has often been proposed that severely handicapped students need one to one instruction. Undoubtedly, one to one instruction has educational validity. In fact, all children, whether or not they are handicapped, are probably in need of, and should receive, the undivided attention of an adult during some portion of their school day. The salient issue here is related to the proportion of the school day that should be consumed with one to one instructional interactions as opposed to larger ratio interactions.

It now seems reasonable to provide fewer one to one instructional arrangements and more arrangements that involve group instructional arrangements.

It is generally assumed that the more one to one instruction a student receives, the more educational advancement can be expected in the long run. However, after a considerable number of failure experiences over a long period of time, we have rejected that assumption. It now seems reasonable to provide fewer one to one instructional arrangements and more arrangements that involve (a) group instruction, (b) clustered individualized instruction in which one teacher engages in individualized interactions with a cluster of three, four, or five students, and (c) instruction that generates adaptive interstudent interactions in the absence of the direct involvement of persons in authority.

Obviously, one to one instruction is enormously expensive in terms of personnel, time, and money. If the only issue was expense and not educational development, educators would be morally bound to

provide such instruction. However, in addition to expense there are other more significant educational reasons for minimization of one to one instructional arrangements.

First, one to one instructional arrangements typically include a teacher providing a cue to which a student is required to respond. When the criterion of ultimate functioning is considered, extensive longitudinal use of teacher cue/student response paradigms prevents or interferes with the acquisition of self initiation skills. Educators have inadvertently developed students who will perform well if a specific teacher provides certain cues but who fail to perform in other settings, with other cues or other persons. Thus, one potentially negative outgrowth of the extensive use of one to one instruction in which teachers provide cues to act is that students become too stimulus bound to those cues. Instruction using additional arrangements may help prevent such problems and thus assist students to function in a variety of adult environments.

One potentially negative outgrowth of extensive one to one instruction in which teachers provide cues to act is that students become too stimulus bound to those cues.

Second, one to one instruction where teachers provide cues to students and where students become bound to those cues impedes the development of adaptive interstudent interactions. Situations are continually reported in which students play a game effectively with a particular teacher, parent, or university student in training, but cannot or will not play with an age or developmental peer. This, of course, is a developmentally unsound outcome in that the student is supposedly preparing to ultimately function in an environment where a substantial amount of his life will be spent relating to, enjoying, and learning from and with a variety of age and developmental peers.

Situations are continually reported in which students play a game effectively with a particular teacher but cannot or will not play with a developmental peer.

Third, it is often hypothesized that a particular student is "not ready for group instruction" due to a variety of medical, behavioral, and educational deficiencies. Thus, teachers often enter into one to one instructional arrangements assuming that the skills the student develops in one to one settings are necessary for, and will culminate in, adaptive performance in group settings. In a large number of situations this has proved to be a false assumption. Indeed, just as teachers learn to function in one to one instructional settings and malfunction in group instructional settings, so do students. The strategies that we are attempting to develop currently require that all students, *no matter what their level of functioning,* receive some instruction in group instructional arrangements.

Just as teachers learn to function in one to one instructional settings and malfunction in group instructional settings, so do students.

There seem to be at least two additional difficulties that might arise from the overuse or misuse of one to one instructional arrangements. First, teachers who develop one to one instructional skills often do so at the expense of the development of group instructional skills. In the past, when attempting to train teachers to work with severely handicapped students, we would begin the training sequence by placing university students in one to one situations on the wards of a residential institution. Often this was an ineffective training experience even though many trainees became quite effective teaching one child to perform one skill. Many of the teaching skills necessary to do so were incompatible with the clustered individualized teaching of groups of 3, 4, or 5 students in public school classrooms who manifested varying degrees of behavior management problems and who required different instructional materials, interaction styles, and response consequences.

Second, in many educational settings in which one to one

instruction is emphasized, the situation ultimately arises in which (a) there are more students than teachers and (b) the students do not have appropriate self regulated play, work, or social skills. Thus, an unfortunately typical scene is to witness a teacher, an aide, a parent, and a practice teacher working in one to one instructional arrangements with four students on one side of the room, while the remaining students are restrained to chairs, roll on floors, self stimulate, or self mutilate in other parts of the room or "watch TV."

Obviously, there are a substantial number of technical problems related to larger ratio instructional arrangements. However, it appears more developmentally tenable at this point to attempt to generate instructional procedures that solve the problems that accrue from larger ratio arrangements rather than to revert to an inordinate use of one to one instruction.

It seems more tenable at this point to solve the problems that accrue from larger ratio arrangements than to revert to an inordinate use of one to one instruction.

Group instruction, as the term is used here, refers to a teacher attempting to teach more than one student at a given time in the same manner using the same words, materials, and so on. In our experience, group instructional arrangements are often inefficient in that (a) teachers tend to teach to the more responsive students in the group, (b) it is extremely difficult to evaluate individual progress in that it is quite cumbersome to verify that each student is performing the skills of concern, and (c) it is the rare group of severely handicapped students who progress through educational curricula at the same pace. On the other hand, the limited and carefully selected use of group instructional arrangements has enormous longitudinal practical value. Sustained attempts must be made to insure that students acquire the skills necessary to secure information from group arrangements.

In summary, the criterion of ultimate functioning requires that individuals perform in complex community settings which demand multiple person cooperative and interactive skills. Extensive use of one to one instructional arrangements over long periods of time results in few of these skills. Thus, where we once recommended the extensive use of one to one instruction, we are now recommending that students also receive a substantial amount of instruction in group and clustered individualized arrangements and in arrangements that allow them to teach and learn from each other. The amounts of time allocated per day to each arrangement, of course, should be determined empirically.

The criterion of ultimate functioning requires that individuals perform in complex community settings which demand multiple person cooperative and interactive skills.

REPEATED PRACTICE STRATEGIES

Repeated practice strategies are teaching strategies that generate large numbers of direct instructional trials in relatively short periods of time. As severely handicapped students typically require relatively large numbers of direct instructional trials in relatively short periods of time in order to attain criterion performance on many tasks, repeated practice strategies are of enormous practical value and their proliferate use is understandable.

There are probably thousands of tasks that have been taught through repeated practice strategies to handicapped and nonhandicapped students. Solving simple mathematical equations, rote counting, differentiating colors, recognizing polar opposites, and verbally labeling flash cards are but a few examples. Repeated practice strategies might be most useful when it is important for a particular skill to be taught, but there is an insufficient amount of naturally occurring instructional trials during the school day. For example, assume that a teacher intends to teach a student to put on and remove cold weather gloves. Under natural instructional conditions, the teacher

may be able to provide the child with three or four teaching trials per day. However, under artificial training conditions a teacher might arrange for 20 or 30 repeated practice teaching trials per day until the child reaches criterion on the task in the repeated practice arrangement. Subsequently, the student can be taught to perform the skill under natural life conditions. In this situation, and in many similar situations, there are relatively few differences between the actions taught under repeated practice arrangements, and the actions required in the natural environment.

Repeated practice strategies have been and will continue to be used to teach many valuable skills to severely handicapped students. However, although there is little that is inherently questionable about repeated practice strategies, the proliferate use and subsequent teacher reliance upon such strategies tends to foster the use of artificial instructional materials, tasks, and settings and the formulation of questionable educational objectives and performance criteria.

Although there is little inherently questionable about repeated practice strategies, teacher reliance upon such strategies tends to foster the use of artificial instructional materials, tasks, and settings.

In an attempt to minimize or avoid the potentially deleterious effects associated with the sustained overuse of repeated practice strategies, at least three alternatives seem reasonable. First, teachers can include a substantial number of functional, as opposed to artificial, tasks in the curriculum. Second, teachers initially can utilize artificial tasks and criteria and then teach students to perform the developed skills in natural settings. For example, touching polar opposites as they are presented via a teaching machine can be considered tenable only if criterion performance on that artificial task is followed by empirical demonstrations of the functional use of polar opposites in natural settings. Third, teachers can increase the number of single person and multiple person peer game skills. Games are crucial educational vehicles in that they are generally more intrinsically interesting than two dimensional two choice discrimination tasks requiring touch responses. They can be used to develop and maintain valuable interstudent language, reading, math, and social skills. Finally, they can enhance the probability of performance across places, persons, and materials in that students can readily engage in games in settings away from school. Again, the point here is that criterion performance of a skill as a result of a repeated practice strategy in an artificial setting does not often result in the acceptable performance of that skill in natural environments.

Teachers initially can utilize artificial tasks and criteria and then teach students to perform the developed skills in natural settings.

SYSTEMATIC VARIATION

Teachers have often been confronted with a student who does well interacting with one adult, but does not interact with others. For example, Johnny may perform for Ms. Jones, but not for anyone else. It might be argued that since it is crucial for Johnny to perform, Ms. Jones should be encouraged to work with him until some time in the future. However, when this strategy is referenced against the standards of the criterion of ultimate functioning, the potential deleterious effects become readily apparent. In heterogeneous adult environments, citizens are required to respond to, and in the presence of, a wide variety of persons. By arranging such circumscribed actions and reactions, a teacher is systematically impeding the development of the skills necessary for independent survival in heterogeneous adult communities. In an attempt to minimize the development of such circumscribed interactions, many strategies are no doubt possible. However, there are several strategies that seem to offer reasonable promise.

By arranging circumscribed actions and reactions, a teacher is systematically impeding the development of the skills necessary for independent survival in heterogeneous adult communities.

Each time a student is taught a functional skill or game, it might be required that the skill be performed (a) in reaction to, or in the presence of, at least three different persons, (b) in at least three different natural settings, (c) in response to at least three different sets of instructional materials, and (d) to at least three different appropriate language cues. To illustrate, assume that a student is taught to play a game with a ball in a classroom. The teacher then must either teach the student to, or empirically verify that the student can, play ball (a) at the playground, (b) at home with a peer, a parent, and a sibling, (c) in response to such verbal language cues as "throw it," "hit me," "zip it over here" and (d) with basketballs, baseballs, and colored plastic balls.

The verbal language cue component of any strategy is particularly crucial in that teachers often inform parents that a student reached criterion on a specific task. Parents often attempt to induce the performance of that skill at home, but fail. Further analysis often reveals that the teacher used one verbal language cue (e.g., "Go find your") and the parents used another (e.g., "Get me"). Attempts to *standardize* the verbal language cues so that both the teacher and the parents use exactly the same words are longitudinally questionable in that in heterogeneous adult community environments different people use many verbal language cues that require the same response. The standardization of *variation,* on the other hand, may enhance performance across verbal language cues. Thus, when a student is taught to perform specific skills in response to a particular verbal language cue, the task should not be considered mastered until the student performs the task in response to the other verbal language cues used in his natural environment that require the same response.

When a student is taught to perform specific skills in response to a particular verbal language cue, the task should not be considered mastered until the student performs the task in response to other verbal language cues.

It seems that teachers have several available options to insure that students perform accurately and consistently to varying cues. For example, assume that four verbal language cues are used in the natural environment in relation to a particular skill. A teacher could use a consecutive strategy and teach appropriate responding to the first, second, third and fourth verbal language cues respectively until the students respond appropriately to all four cues when they are presented randomly. A teacher could use a concurrent strategy in which students receive training on all four cues at the same time until they respond appropriately to all four cues when they are presented randomly. A teacher could use a combined or a different strategy. Regardless of the particular strategy, students must be prepared to perform in complex natural environments that are constantly varying and evolving. Thus, rather than support the orientation that the instructional environments of severely handicapped students should be standardized, we are suggesting that their instructional environments should be "consistently inconsistent" or systematically varied.

Instructional environments should be "consistently inconsistent" or systematically varied.

TOWARD NATURALIZED CURRICULA

The instructional materials, tasks, consequences, objectives, and criteria to which severely handicapped students are exposed in educational settings should resemble those that students will encounter and need in community domestic, social, leisure, and vocational settings. However cumbersome, time consuming, inconvenient, or expensive it may be to do so, the pegs, felt squares, pictures of money, tokens, pictures, edible consequences, and many, if not all, of the commercially available kits and irrelevant paper and pencil tasks should be faded out. Real money, real streets and cars, real people, real stores, real sounds and smells, real tools and objects, real group homes, real

Commercial kits and irrelevant paper and pencil tasks should be faded out; real money, real streets and cars, real people, real stores, real world settings must replace them.

world settings, real appliances and utensils, real motor skills, and real ridicule, rejection, and disappointment must replace them. An empirically verifiable naturalized life space curriculum designed to teach the skills required in heterogeneous community environments is the order of the day.

There are at least three major reasons why curricula for severely handicapped students should be naturalized. First, artificial materials and settings seldom provide students with the information needed to solve practical problems in natural settings. Because a severely handicapped student can solve the problem "2 + ___ = 4" on a commercial worksheet in a classroom, it does not necessarily follow that he will be able to respond correctly to the problem in which four people will be eating dinner and there are only two chairs at the table. Crucial information contained in the latter functional task is not present in the former artificial paper and pencil task.

Second, the actions and criteria required by many of the most popular artificial tasks and materials are often not the crucial actions required in more functional environments. Artificial tasks and materials often require touching, marking, and verbally labeling actions. Functional tasks, materials, and criteria, on the other hand, require picking up, getting, showing, assembling, distributing, responding motorically to printed stimuli at community accepted rates, latencies, and durations. Certainly there are situations in which it is feasible to start with rudimentary movements, limited or isolated instructional sequences, and artificial materials, but education should never stop there. It should not stop until the teacher has demonstrated empirically that these students can function as independently as possible in the most open, positive, and actualizing environments imaginable.

There are situations in which it is feasible to start with rudimentary movements, limited or isolated instructional sequences, and artifical materials, but education should never stop there.

Third, since we are preparing students to function in heterogeneous adult environments, most of the necessary training experiences should be conducted in extra-school building environments. The school as manifested by a building may be necessary,but it is not sufficient as the major or only facility needed to prepare severely handicapped students to reach the criterion of ultimate functioning. These students need schools with small permeable walls. Instead of bringing sheltered workshop tasks into a school workshop, instructors should disband the school workshop and teach the students the required skills at real workshops. Instead of using a "home economics room" in a public school, teachers should use real natural homes, foster homes, and group homes as the locations for the development of crucial self help, grooming, social, and domestic maintenance skills. Similarly, other vocational, shopping, service procurement, and leisure skills should be taught during and after traditional school hours, at real bowling alleys, theatres, stores, restaurants, swimming pools, office buildings, laundries, and motels.

Since we are preparing students to function in heterogeneous adult environments, most of the necessary training experiences should be conducted in extra-school building environments.

CONCLUDING COMMENTS

Perhaps it is appropriate here to relate to the relative merits of simulated training experiences. There is no doubt that criterion performance on simulated tasks can be a valuable adjunct to the development of many crucial developmental skills. In fact, under certain circumstances it may be construed as almost mandatory that simulated experiences be utilized (bus riding and street crossing seem reasonable examples). However, severely handicapped students do not allow the degree of inference necessary to assume that criterion performance on a simulated task *guarantees* criterion performance in

the environment in which the skill will ultimately be required. There can be no substitute for empirical verification of the performance of a skill in the natural environments in which the skill is required.

If we now had available to us the most tolerant of all possible communities, an unlimited budget, the collective use of the best professionals in existence, all necessary enabling legislation, the most advanced service delivery models, ideal parents, and excellent medical care, we still would not be able to provide severely handicapped students all needed services. The skills of our students are limited by the information we have within our grasp. The information we have within our grasp is tragically meager. If substantial improvements in services to severely handicapped students are to accrue, new information must be generated. As educators we must realize that we are infants in this area that most if not all of our pet theories must be revised, and that we need to expose our ideas and practices to the scrutiny of all. We must now confront our weaknesses, failures, and insecurities and set about the long hard task of demonstrating, rather than inferring, the best possible services for a most deserving group of citizens.

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REFERENCE

Dunn, L. M. Special Education for the Mildly Retarded——Is Much of It Justifiable? Exceptional Children, 1968, 35, 5-22.

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PROCEDURES OF TASK ANALYSIS AS RELATED TO DEVELOPING INSTRUCTIONAL PROGRAMS FOR THE SEVERELY HANDICAPPED

Wes Williams

Introduction

Severely handicapped students do not readily learn from casual and unplanned exposure to instructional materials. How can instructional programs which will maximize the learning of severely handicapped students be created? One way to maximize the learning of severely handicapped students is to delineate skill sequences which lead from students' current functioning levels to the mastery of selected behavioral objectives. For instance, a skill sequence for teaching a student to independently unbutton a shirt could be:

1. Student should unbutton a special shirt with oversized buttons and buttonholes when the buttons are three fourths through the buttonholes.

2. Student should unbutton a special shirt with oversized buttons and buttonholes when the buttons are one half through the buttonholes.

3. Student should independently unbutton a special shirt with oversized buttons and buttonholes.

4. Student should unbutton a regular shirt when the buttons are one half through buttonholes.

5. Student should independently unbutton a regular shirt.

A rudimentary skill sequence for teaching a student to express and comprehend verb-noun phrases could be:

1. Nouns - Objects
   a. Functional Object Use: Student should demonstrate the socially appropriate use of objects (e.g., drink from cup, eat with spoon, wash with washcloth).
   b. Receptive: When presented a cue such as "Touch/show me/point to/take" the student should touch/find/point to/take the specified object from an array of objects.
   c. Expressive: When presented a cue such as, "What is this?" (teacher points to an object) the student should indicate (e.g., label, sign, point to the object's name on a communication board) the name of the object.

2. Verbs - Actions
   a. Receptive: When presented a cue such as, "Show me how you____," or "How do you____?" the student should perform the appropriate action.
   b. Expressive:
      i. Label action - self: When presented a cue such as "What are you doing?" the student should label his/her action.
      ii. Label action - others: When presented a cue such as "What is____,doing?" the student should label the action.

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3. **Verbs - Nouns** (active verb, noun object)
   a. Receptive: Presented with a cue such as "Show me how you push (verb) wagon (noun)" the student should choose the correct object from an array and perform the correct action.
   b. Expressive:
      i. Label actions - self: When presented a cue such as, "What are you doing?" the student should say, "Push (verb) wagon (noun)."
      ii. Label action - others: When presented a cue such as, "What is____doing?" the student should say, "Push (verb) wagon (noun)."

In our judgment task analysis is essential to the development of efficient skill sequences. Task analysis is a process of determining what to teach in what sequence to insure student mastery of an objective. The product is a skill sequence. That is, the product is a precise delineation of a behavioral objective, the objective's component skills and an appropriate sequencing (easy to hard) of the component skills. The sequence of component skills should lead from responses in the student's repertoire to mastery of the objective. The product of task analysis is not a statement of how to teach a skill but rather a statement of what is to be taught. A precise delineation of what is to be taught is an obvious prerequisite to determining how to teach target skills. Articulation of a skill sequence is also a requisite to assessing students' skill levels. That is, a skill sequence delineates what skills should be assessed.

Task Analysis: Steps to Completion

The first step in performing a task analysis is to define an appropriate behavioral objective and search instructionally relevant resources for component skills, sequences and instructional programs related to the objective. Once a behavioral objective has been specified and relevant resources reviewed, the objective should be divided into steps or component skills which lead from responses in the students' repertoires to mastery of the objective. Next unnecessary and redundant component skills should be eliminated. Finally, prerequisite skills should be determined. That is:

1. state the behavioral objective and review instructionally relevant resources,
2. derive and sequence the component skills of the objective;
3. eliminate unnecessary component skills;
4. eliminate redundant component skills;
5. determine prerequisite skills.

These steps will be described in detail in later sections of this paper.

It must be emphasized that we do not expect you to be proficient at task analysis after only reading this chapter. To become proficient at performing task analysis use the basic five step process delineated here to task analyze an instructional objective. Then submit the skill sequence which results from the task analysis to your colleagues for their constructive criticism. On the basis of the criticism revise the skill sequence and resubmit it for further constructive criticism. Continue this process until you and your colleagues are satisfied with the skill sequence. The critical thinking skills essential to task analysis can only be learned through performing task analyses and subjecting their resulting skill sequences to constructive criticism.

Why a Teacher Should be Skilled at Task Analysis

Notions as to what the component skills of an objective are and how such skills might be analyzed and sequenced can be obtained or abstracted from at least the following:

a. general child development literature;
b. general cognitive development literature;

c. general special education literature;
d. commercially available curriculum packages;
e. logical post-school performance demands.

With all the information on how to sequence skills available, why is there a need to perform task analysis? When we task analyze an objective, aren't we just reinventing the wheel? If, in the course of reviewing instructionally relevant resources, you find a skill sequence or commercially available instructional program which precisely fits your students' functioning levels and needs, use it. We have been developing instructional programs for the severely handicapped for the past seven years. Unfortunately, it has been our experience that teachers of severely handicapped students can rarely, without substantial adaptation, use commercially available or normal child development skill sequences. Thus, from a training perspective it is essential to provide teachers with skills and experiences in task analysis so that in practical situations they can adapt available skill sequences or create new sequences to fit the developmental functioning level and needs of their students.

There are at least four reasons teachers of severely handicapped students should be skilled in the use of task analysis.

First, task analyses generate skill sequences. These sequences delineate starting points, terminal objectives and enhance the possibility that essential component skills will not be neglected. If task analysis is used to derive long term skill sequences (sequences the completion of which will encompass a period of years) the long term skill sequences should minimize the potentially harmful effects of changes in teachers and administrators on longitudinal instructional programming.

Second, task analysis and the resulting skill sequences facilitate instruction that is tailored to individual functioning levels. That is, within the skill sequence model mastery of component skills of an objective can be assessed before instruction and students need only be instructed on skills they lack and for which they have mastered the prerequisite skills. In addition, students can be permitted to proceed through the skill sequence at their own pace, taking longer on trouble spots and skipping component skills on which they demonstrate mastery.

Third, well defined skill sequences across skill areas (e.g., self-help, language, play, social) may be used to precisely delineate student functioning levels within each skill area. A precise delineation of students' current functioning levels on a variety of skill sequences is more relevant to the development of viable instructional services than the use of such descriptions as autistic, severely retarded, trainable, psychotic, emotionally disturbed, and low MA.

Fourth, use of task analysis and the resulting sequences facilitates the development of more efficient classroom programming. That is, a teacher can systematically monitor student progress through a sequence and obtain data concerning whether the component skills of an objective were appropriately broken down and ordered. This information can be used to continually improve the efficiency of skill sequences and classroom programming.

Determining Behavioral Objectives

A preliminary step to task analysis is determining appropriate behavioral objectives for the students. Through assessing the students' performance in previous programs, informal evaluations and formal evaluations, the students' skill levels should be determined in such areas as self-help, motor, communication and social. There are several assessment systems available which are geared to the severely and profoundly retarded. For example, the TARC assessment system for severely handicapped children provides a short form assessment of the self-help, motor, communication and social skills of the severely and profoundly retarded. After determining the students' skill levels, the communication, motor, self-help and social skills the students need to function in their immediate and future environments (e.g., group homes, vocational settings, recreational settings) should be determined. On the basis of the students' current skill levels and potential skill needs behavioral objectives should be stated for each student.

Behavioral objectives are statements of what skills students should learn to perform under what conditions. The first step in establishing a behavioral objective is to describe what observable and measurable skills the students should perform when they have mastered the objective. Observable and

measurable skills have definite beginnings and endings. That is, objectives should include verbs (skills) such as point, write, name, list, pick up,match, etc., not verbs such as appreciate, understand, realize, be aware of or comprehend. In some instances we should be concerned with what students understand, believe, feel, know or appreciate. An objective could be teaching students to understand specified noun concepts such as cup. However, we can only make inferences concerning students' knowledge, understanding or appreciation by assessing the overt and measurable behaviors the students perform. That is, we can only make statements about students' understanding of a noun concept such as cup by stating what behaviors the students perform in relation to cups. A behavioral objective could be teaching students to label specified noun concepts: that is in the presence of specified objects (e.g., cups) and given the cue, "What is this?" the students should say "cup."

The second step in establishing a behavioral objective is specifying under what conditions, "givens," the students are to perform the skills. Precise statements of "givens" are necessary if we are to agree on which students have mastered an objective. What if four students presented various cups and given the cue, "What is this?" can only correctly label white coffee cups. On the other hand, two different students can correctly label a variety of cups which differ in size and color. Would you and I necessarily agree on which students mastered the objective? A better objective would be: presented specified objects (blue, white, big or little cups) and the cue, "What is this?" the students should say "cup."

Even after precisely specifying the "givens" you and I might not agree on which students have mastered an objective. What if four students correctly label 85% of the cups. However, two different students correctly label 90% of the cups. Have all the students learned the concept of cup? We failed to state in our objective the level of performance desired. For objectives to be useful they must state desired performance levels.

An objective can be defined and refined until it becomes absurdly long and detailed. However, it is only necessary to write objectives in enough detail that outside observers can determine and agree with you on which students have mastered objectives. That is, objectives should: 1) specify the overt and measurable skills students should perform; 2) identify the conditions under which the skill is to occur; and 3) define the criterion of acceptable performance.

It must be noted that objectives do not determine teaching style. Think about how you would teach a student to master each of these objectives.

1. When seated at a classroom worktable with the teacher, presented a blue, white, big or little cup and given the cue, "What is this?" the student should say "cup."

2. When seated at lunch with the teacher, presented a blue, white, big or little cup and given the cue, "Tell me what this is," the student should say "cup."

Both objectives state what skills students will learn to perform under what conditions However, for either objective students could be taught to perform the skills under the specified conditions thr[illegible]gh play activities, highly structured drills, group instruction, individual instruction, and so on.

Applying the Five Steps of Task Analysis

When a behavioral objective has been specified, the next step in the program design is to identify a sequence of component skills which leads from responses in students' repertoires to performance of the objective. Task analysis begins with any behavioral objective and continues until all the component skills students have to be able to perform to master an objective have been specified and sequenced from easy to hard. The component skills may be identified through asking the question, "To master this objective what necessary component skills must the students be able to perform?" For each component skill identified the same question may be asked until further component skills cannot be identified. This process could be continued indefinitely. In practice a task analysis usually stops when the new component skills identified are ones already mastered by the students.

The task analysis process will first be illustrated through a task analysis of labeling noun concepts. Then an analysis of a self-care, vocational and motor skill will be presented. The noun

concept example will use the concept of cup. However, the task analysis should be valid for any noun concept (e.g., spoon, ball, book). As described above a task analysis can usually be accomplished in five steps:

1. State the behavioral objective and review instructionally relevant resources;
2. Derive and sequence the component skills of the objective;
3. Eliminate unnecessary component skills;
4. Eliminate redundant component skills;
5. Determine prerequisite skills.

Labeling Noun Concepts: Cups

1. The objective is to teach labeling of noun concepts. That is, presented specified objects (blue, white, big or little cups) and the cue, "What is this?" the student should say "cup." Generally, the more information about the skill area brought to the task analysis the better the task analysis. Use references such as curriculum guides, textbooks, commercially available materials, references on normal child development, other teachers' task analyses and learn what component skills other people have delineated and how they sequence them.

Review how to task analyze concepts through reading such sources as, "Teaching: A Course in Applied Psychology" by Becker, Engelmann and Thomas (1969). Look at such commercially available materials as Distar Language and Peabody Language Kits to determine how they analyze and teach concepts. Then review developmental literature on concept development, such as Piaget (1970), to determine what component skills children typically master before learning to label noun concepts. If a commercially available instructional program or developmental skill sequence which precisely fits your students' needs is found, use it. If a program or skill sequence which fits your students' needs is not available, perform a task analysis to adapt available sequences or create new sequences.

Obviously, your ability to research a skill area before performing a task analysis depends on the availability of references, your ability to directly select relevant references without first sorting through reams of nebulous literature and the amount of research time available. (You will typically want to implement a program tomorrow, not wait two months until you have thoroughly researched it.) You and your school should develop a professional library of relevant resource material. Instructional Material Centers (IMCs) and Area Resource Centers (ARCs) are good resources. One of the best sources of information are the task analyses of other teachers. We suggest that you develop a procedure for sharing relevant task analyses with other teachers in your system. To get you started at the end of this paper we have listed selected references we hope will help you derive task analyses for specific skill areas.

2. When you have completed the essential reference work, you are ready to derive the necessary component skills of the target behavioral objective. The component skills are derived through three processes: 1) listing the component skills suggested by commercial materials and relevant developmental literature; 2) as described earlier asking the question, "To master this objective what component skills must the student be able to perform?" This question is asked until further component skills cannot be derived; and 3) performing the skills required by the objective yourself, watching others perform the skills and imagining yourself performing the skills while noting the necessary component skills and their order of occurrence. Our objective was to teach labeling of noun concepts such as cup.

Figure 1 displays a lattice of a skill sequence which could be generated through such a task analysis.[1]

If the students are to learn to label cups, they should be able to discriminate between cups and noncups. Thus, they should be able to discriminate visual cues. Discriminating visual cues is our first component skill (Prerequisite Skills, Box 1). Blind students can use other sense modalities (e.g. tactile) to discriminate between cups and noncups (Prerequisite Skills, Box 2). Literature on child development indicates that children functionally use objects (that is, they know what to do with the objects such as drink from a cup, eat with a spoon) before they learn to associate names (labels) with

objects. Another component skill is functional object use (Prerequisite Skills, Box 3). (Note: Functional object use can be broken into further component skills.) Furthermore, children can usually match an object to an identical object before they can associate a label with an object. Another component skill could be when presented a cup students should be able to find (match) an identical cup from an array of one cup and several noncups (Phase I, Box 1). Many instructional materials teach matching through having the students draw lines between like objects. The students should be able to match a cup to another cup through drawing lines between them.

Students should know that cups can be different sizes, shapes and colors and still be cups. We must translate the notion of knowing into a behavioral objective. Students should be able to match a cup to a similar cup (nonexact match) from an array of objects (Phase II, Box 1).

[1] *In a lattice a step format is used. That is, the first component skill of a skill sequence is placed in the lower left hand corner and each sequential component skill is placed in boxes connected by a line with a 90 degree angle.* *This lattice format indicates that a lower skill may facilitate the acquisition*

of higher skills but mastery of the lower skill is not necessary before the student can begin to learn higher skills. The terminal objective is always placed in the upper right hand box and each component skill hangs from that box. Be sure to sequence the component skills from easiest (far left box) to hardest (far right box). If a skill must be learned before another skill, hang the boxes directly underneath one another with a connecting straight line.

a possible lattice -

See Smith, D. D., Smith, J. O., and Haring, N. G. The Modified Lattice System: An Approach to the Analysis and Sequence of Instruction and Objectives, Experimental Education Unit Child Development and Mental Retardation Center, University of Washington, for details on constructing lattices.

Nonverbal comprehension of object labels is another component skill (Phase III, Box 1). That is, children can usually identify objects before they can name them. For example, when given the cues such as "touch cup" or "point to cup," children can identify which object is a cup before they can label objects when given a cue such as "What is this?" For students to demonstrate nonverbal comprehension of object labels they should be able to discriminate auditory cues (Prerequisite Skills, Box 4). Deaf children may demonstrate nonverbal comprehension of the sign language symbol for cup (Prerequisite Skills, Box 5).

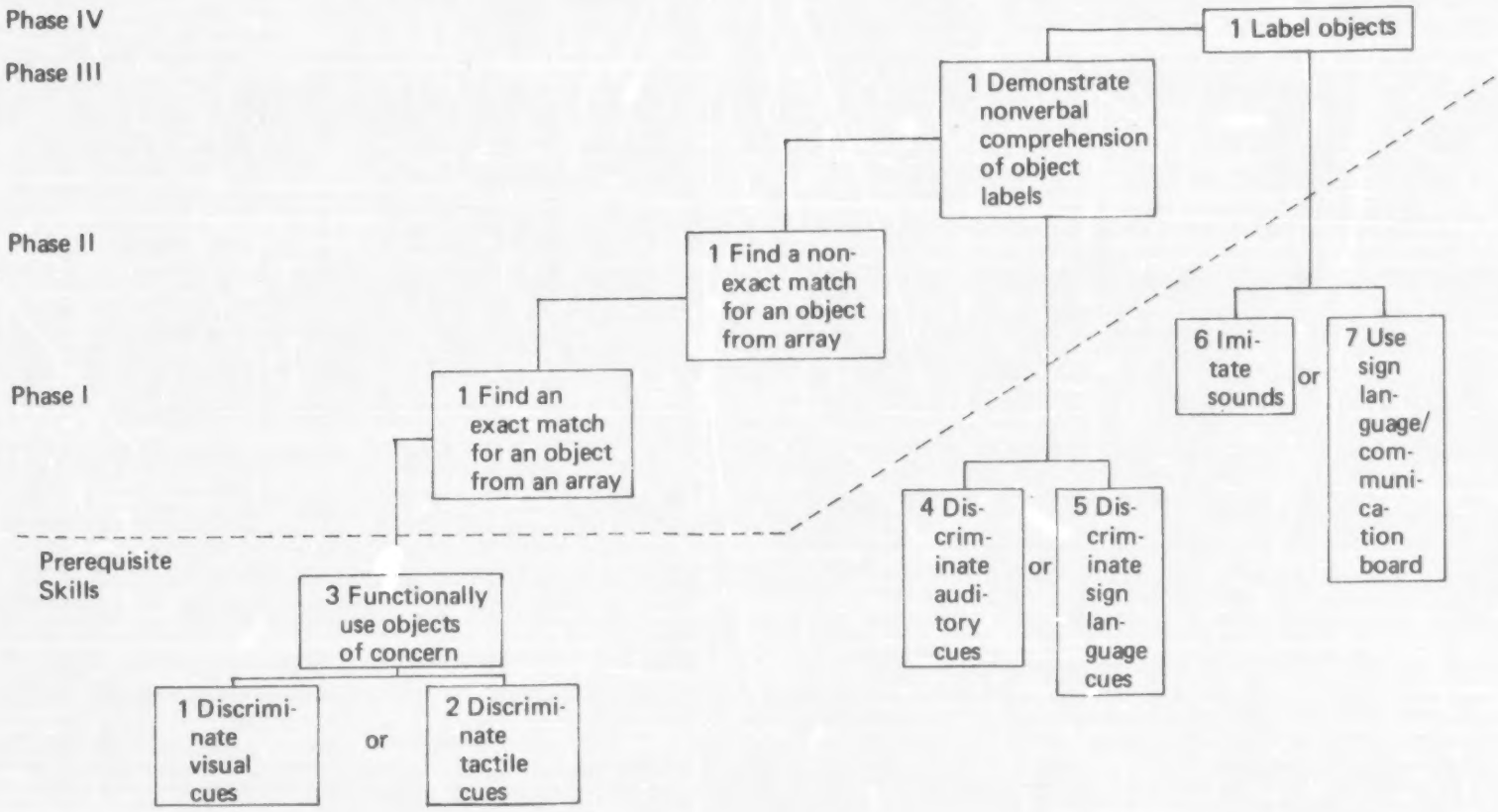
If students are going to learn to name (label) objects, they should be able to imitate sounds (Prerequisite Skills, Box 6) (Note: Imitation can be broken into many component skills.) Nonverbal students may use sign language or communication boards to label objects (Prerequisite Skills, Box 7).

Finally, students who can imitate sounds or use sign language/communication boards, functionally use objects, discriminate objects (match), and demonstrate nonverbal comprehension of the object labels should be ready to learn to label objects (Phase IV, Box 1).

This simplified task analysis suggests that the objective has at least the following component skills:

a. can discriminate visual or tactile cues;
b. can discriminate auditory cues or sign language cues;
c. can functionally use the objects of concern;
d. given an object can find (match) an identical object from an array of objects;
e. given an object can match a similar object (nonexact match) from an array of objects;
f. match identical objects by drawing lines between objects;
g. demonstrate nonverbal comprehension of object labels;
h. imitate sounds or use sign language/communication boards.

FIGURE 1
Labeling Noun Concepts Lattice



3. A key word in deriving necessary component skills for an objective is necessary. Many common classroom activities are closely related to valid objectives and it is easy to mistake these related activities for activities necessary for learning to perform the skills required by an objective. For example, the skill indicating objects which are identical by drawing a line between them is a related skill not a necessary one. Because this skill is not necessary to the learning of skills required by the objective we will eliminate it. However, because an activity is not included in our task analysis does not mean that it is not instructionally relevant. Many related activities or skills, such as drawing lines between objects, may facilitate skill generalization or transfer. That is, they require students to use a skill across related tasks.

4. Eliminate redundant or equivalent component skills.

5. When only the necessary component skills have been established entry or prerequisite skills should be delineated. The determination of which component skills are prerequisite skills is arbitrary. Generally, we don't intend to teach students everything (e.g., functional object use, discriminating visual cues, imitation of sounds) within one instructional program, such as a noun concept program. Functional object use could be taught as part of a self-help or play program and imitation as part of an imitation program. Thus, some component skills can be designated as prerequisite skills. In this case we will designate discriminating visual cues, discriminating tactile cues discriminating auditory cues, discriminating sign language cues, functional object use, imitating sounds and use sign language/communication board, as prerequisite skills.

The skill sequences or hierarchies generated through the process of task analysis may be represented in the form of either vertical skill listings or lattices. There are advantages to both the list format and the lattice format. The list format allows a more precise specification of givens or conditions while the lattice format more clearly portrays an overview of all the component skills of the sequence and their interrelationships. Figure 1 displayed the skill sequence in a lattice format. Figure 2 displays the skill sequence in a vertical list format.

The noun concept task analysis illustrated the basic process of task analysis. To illustrate the utility of task analysis across curriculum areas an example task analysis in the areas of self-care skills (taking pants off), vocational skills (packaging fish bait), and motor skills (sitting) will be presented.

Self-Care Skill: Taking Pants Off
(Adapted from Meyers, Sinco and Stalma, 1973)

1. A self-care behavioral objective could be teaching students to independently take their pants off; that is, when students in a standing position in stocking feet wearing pants with an elastic waistband are given the cue "(Name), take off your pants," the students should put their hands on the waistband of their pants in a grasping manner (four fingers on outside, thumb on inside), bend and push the pants down to their ankles. Next the students should sit down, bend at the waist and grasp the pants which are around their ankles. Then the students should lift one foot straight up and pull the first pants leg off. Finally, the students should lift their second foot straight up and pull their second pants leg off.

When the objective has been defined, go to curriculum guides, textbooks, commercially available materials, references on normal child development, other teacher's task analyses and learn what component skills other people have identified and how they sequence them. For analyses of dressing skills we suggest such sources as, *"Self-help Instruction, Systematic Instruction for Retarded Children: The Illinois Program, Part III," Linford, Hipsher, and Sililovitz (1972) and "Behavior Modification: New Ways to Teach New Skills," Panyan (1972), "The Right to Education: A Curriculum for the Severely and Profoundly Retarded," Meyers, Sinco and Stalma (1973).* If a commercially available instructional program precisely fits your students' needs, use it. If a program which fits the students' needs is not available, perform a task analysis to adapt available sequences or create new sequences.

FIGURE 2

Objective - to teach labeling of noun concepts: Presented selected objects (blue, white, big or little cups) and the cue, "What is this?" the student should say "cup."

Criterion - the student should label the cups correctly nine out of ten times they are presented a cup and the cue "What is this?"

Prerequisite skills: The student should be able to:

1. discriminate visual or tactile cues;
2. functionally use the objects (drink from a cup);
3. discriminate auditory or sign language cues;
4. imitate sounds or use sign language/communication board.

Phase I: Given a blue, white, big or little cup and the cue, "Show me cup," the student should find (touch, point to, pick up) its exact match from an array of three objects (one cup and two noncups).

Part 1: The student should find the match for the blue cup.
Part 2: The student should find the match for the white cup.
Part 3: The student should find the match for the big cup.
Part 4: The student should find the match for the little cup.

Phase II: Given a blue, white, big or little cup and the cue, "Show me cup," the student should find (touch, point to, pick up) a cup (not an exact match) from an array of three objects (one cup and two noncups).

Part 1: The student should find a match for the blue cup.
Part 2: The student should find a match for the white cup.
Part 3: The student should find a match for the big cup.
Part 4: The student should find a match for the little cup.

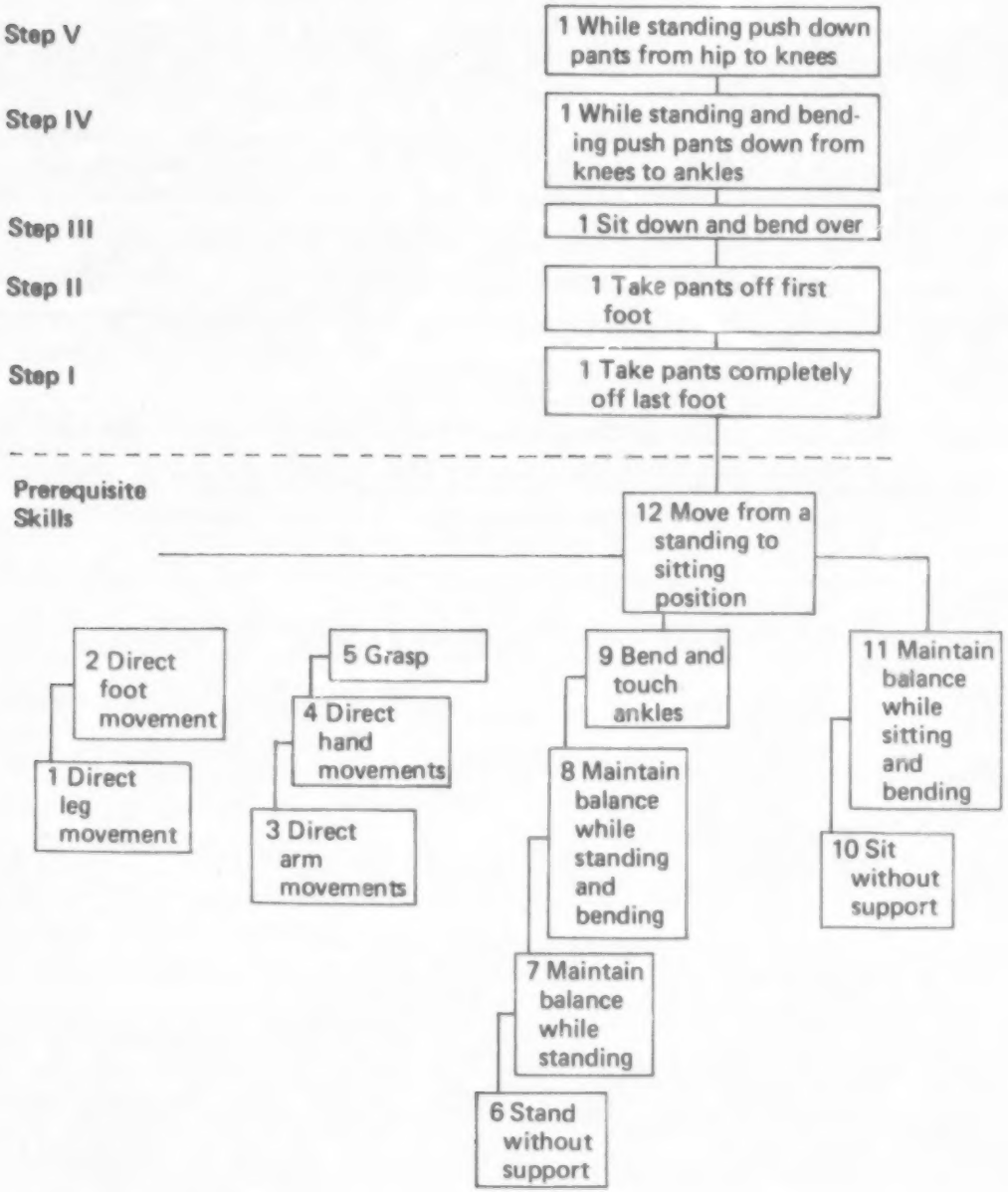
Phase III: Given an array of three objects, one cup (blue, white, big or little) and two noncups and the cue, "Show me cup." the student should find (touch, point to, pick up) the cup.

Part 1: The student should find the blue cup.
Part 2: The student should find the white cup.
Part 3: The student should find the big cup.
Part 4: The student should find the little cup.

Phase IV: Presented a blue, white, big or little cup and the cue, "What is this?" the student should say "cup," make the sign for cup or point to cup on a communication board.

Part 1: The student should label the blue cup.
Part 2: The student should label the white cup.
Part 3: The student should label the big cup.
Part 4: The student should label the little cup.

FIGURE 3
Taking Pants Off Lattice


Step V
1 While standing push down pants from hip to knees
Step IV
1 While standing and bending push pants down from knees to ankles
Step III
1 Sit down and bend over
Step II
1 Take pants off first foot
Step I
1 Take pants completely off last foot
Prerequisite Skills
12 Move from a standing to sitting position
2 Direct foot movement
1 Direct leg movement
5 Grasp
4 Direct hand movements
3 Direct arm movements
9 Bend and touch ankles
8 Maintain balance while standing and bending
7 Maintain balance while standing
6 Stand without support
11 Maintain balance while sitting and bending
10 Sit without support

2. When the essential reference work is complete, derive the necessary component skills of the behavioral objective As previously described, the component skills are derived through three processes: 1) listing the component skills suggested by relevant references; 2) asking the question "To master this objective what component skills must the student be able to perform?" until further component skills cannot be derived; and 3) performing the skills required by the objective yourself, observing others performing the skills, and imagining yourself performing the skills while noting the necessary component skills and the order of their occurrence. Such analysis might lead to the sequence displayed in the lattice of Figure 3.

If students are to take their pants off their feet, they should be able to direct their leg and foot movements (Prerequisite Skills, Boxes 1 and 2). If students are to pull their pants down and off their feet, they should also be able to direct their arm and hand movements and grasp (Pincher grasp) to guide the pants (Prerequisite Skills, Boxes 3, 4 and 5). Furthermore, if students are to remove their pants starting from a standing position, they should be able to stand without support, maintain balance while standing (compensate for movements to the right or left, forward or backward), and maintain balance while bending from a standing position, bend and touch their ankles (Prerequisite Skills, Boxes 6, 7, 8 and 9). In addition, if studnets are to pull their pants legs off from a sitting position, they should be able to sit without support, maintain balance while sitting and bending, and independently move from a standing to sitting position (Prerequisite Skills, Boxes 10, 11 and 12).

For students to take their pants off from a standing position they must: first grasp the waistband of their pants (four fingers on the outside, thumb on the inside) and push the pants down from their hips to their knees (Step V, Box 1); second, while standing and bending push the pants down from their knees to their ankles (Step IV, Box 1); third, sit down and bend over (Step III, Box 1); fourth lift one leg straight up and take the pants off their first foot (Step II, Box 1) and fifth, place their first foot back on the floor, lift their second leg directly up and pull the pants off their second foot (Step I, Box 1).

You probably noticed that there is an apparent mistake in the lattice. That is, in the lattice the first component skill the students have to perform (pushing down pants from hips to knees) is the last step (Step V) and the last component skill the students have to perform (taking pants completely off) is the first step (Step I). The lattice is correct. When teaching the component skills of many objectives, especially self-help, self-care, and vocational objectives, the last skill students have to perform is often taught first.

Teaching the last skill to be performed first may not appear to make sense. However, imagine you are teaching students to eat independently with a spoon. The first skill students must perform is filling a spoon, the second is moving the spoon from plate to mouth, and the last is inserting the spoon in their mouth. Let's say you teach the first skill of the sequence first. Now the students have their spoons filled but they cannot get the spoon to their mouth. Thus, they do not enjoy the natural reward of placing a full spoonful of food in their mouth. You would have to reward (with a toy, praise) the students for filling their spoon and then physically help them move the spoon to their mouth and insert it.

On the other hand, what if you taught inserting the spoon first? The reward for learning to independently insert the spoon would be the food. This is a naturally occurring reward that should ultimately maintain the students' self-feeding. Next, you could teach the students to independently move their spoon from their plate to their mouth. Then you could teach the students to fill their spoon. Finally, you could teach the students to independently fill their spoon, move their spoon to their mouth and then insert the spoon. In this case teaching the last component skill of the sequence of skills first is advantageous. That is, students are always rewarded with food for correct performance of the final skill in the sequence. Similarly, it is efficient to teach the last component skill of many objectives first. For such objectives the task analysis process involves first delineating which component skills students must perform first, second, etc. but teaching the component skills in reverse order.

3. Eliminate unnecessary component skills.

4. Eliminate redundant or equivalent component skills.

5. Determine which component skills are prerequisite skills. Such skills as directing leg movements, directing foot movements, directing arm movements, directing hand movements, grasp, standing without support, maintaining balance while standing, maintaining balance while standing and bending, sitting without support, maintaining balance while sitting and bending, and moving from a standing to sitting position could be taught through a motor skills program concurrent with or prior to the dressing program. These skills are arbitrarily delineated as prerequisite skills.

Figure four depicts the skill sequence in a vertical list format.

Vocational Skill: Packaging Fish Bait
(Adapted from Brown, Bellamy, and Sontag, 1971)

1. A vocational skill behavior objective could be teaching the students to package fish bait; that is, given fish hooks, bait, and a glass jar the students should insert fish hooks into bait, pile four completed strips of bait into a pile, fold all four strips (together) into thirds, and place the folded bait into a glass jar.

When the objective has been delineated, go to curriculum guides, textbooks, commercially available materials, and other teachers' task analyses and learn how other people have task analyzed vocational tasks. For analyses of vocational tasks go to such resources as *"Training the Mentally Retarded in the Production of Complex Production: A Demonstration of Work Potential" Barloff and Tate, 1967; "A Technique for Programming Sheltered Workshop Environments for Training Workers," Crossin (1969); "The Learning of Difficult Visual Discriminations by the Moderately and Severely Retarded," Gold and Barclay (1973).*

2. When the essential reference work is complete, derive the necessary component skills of the behavioral objective. The component skills may be derived through: 1) asking the question "To master this objective what component skills must the student be able to perform?" until further component skills cannot be derived; and 2) performing the skills required by the objective yourself, observing others performing the skills, imagining yourself performing the skills and noting the order of their occurrence. Figure 5 displays the completed task analysis in a lattice.

If the students are to package bait, they should be able to direct arm movements, direct hand movements and use pincer grasp (Prerequisite Skills Boxes 1, 2 and 3). The remainder of the task analysis is a description of what skills the students should perform in what sequence to complete the task. These skills include: place pieces of bait on table with tail on left (Step I, Box 1);[2] pick up bait with one hand (Step II, Box 1); pick up fish hook with other hand (Step III, Box 1); put fish hook into hole on right side (head side) of bait (Step IV, Box 1); pull fish hook through hole on left side (tail) of bait (Step V, Box 1); pull hook tightly into bait (Step VI, Box 1); place bait with hook on table (Step VII, Box 1); flatten hook against bait (Step VIII, Box 1); complete 3 more pieces of bait (Step IX, Box 1); place all four pieces of bait into pile (Step X, Box 1); pick up all four completed pieces of bait together (Step XI, Box 1); fold 1/3 of bait (tail side) under (Step XII, Box 1); fold 1/3 of bait (head side) under (Step XIII, Box 1); and place completed bait into glass jar with hook pointing up (Step XIV, Box 1).

3. Eliminate unnecessary component skills.

4. Eliminate redundant or equivalent component skills.

5. Determine which component skills are prerequisite skills. Such skills as directing arm movements, directing hand movements and pincer grasp could be taught through a motor skill program. These skills are arbitrarily delineated as prerequisite skills. Figure 6 displays the skill sequence in a vertical skill list format.

[2] *A jig or prosthetic device may be used with students who cannot differentiate left from right, head side, tail side, 1/3 of a quantity, a quantity of 3, up, down, etc.*

FIGURE 4

Objective Teaching students to independently take off their pants: that is, when students in a standing position in stocking feet wearing pants with an elastic waistband are given the cue "(Name), take off your pants," the students should put their hands on the waistband of their pants in a grasping manner (four fingers on outside, thumb on inside), bend and push the pants down to their ankles. Next, the students should sit down, bend at the waist and grasp the pants which are around their ankles. Then the students should lift one foot straight up and pull the first pants leg off. Finally, they should lift their second foot straight up and pull the second pants leg off.

Criterion: The students should pull their pants down nine out of ten times they are given the directive "(Name), take off your pants."

Prerequisite Skills:

- Direct leg movement
- Direct foot movement
- Direct arm movement
- Direct hand movement
- Grasp
- Stand without support
- Maintain balance while standing
- Bend and touch ankles
- Maintain balance while standing and bending
- Sit without support
- Maintain balance while sitting and bending
- Move from a standing to sitting position

Step I: Teaching students to take pants completely off last foot.

Step II: Teaching students to take pants off first foot.

Step III: Teaching students to sit down and bend over.

Step IV: Teaching students while standing and bending to push their pants down from knees to ankles.

Step V: Teaching students while standing to push their pants down from hips to knees.

FIGURE 5
Packaging Fish Bait Lattice

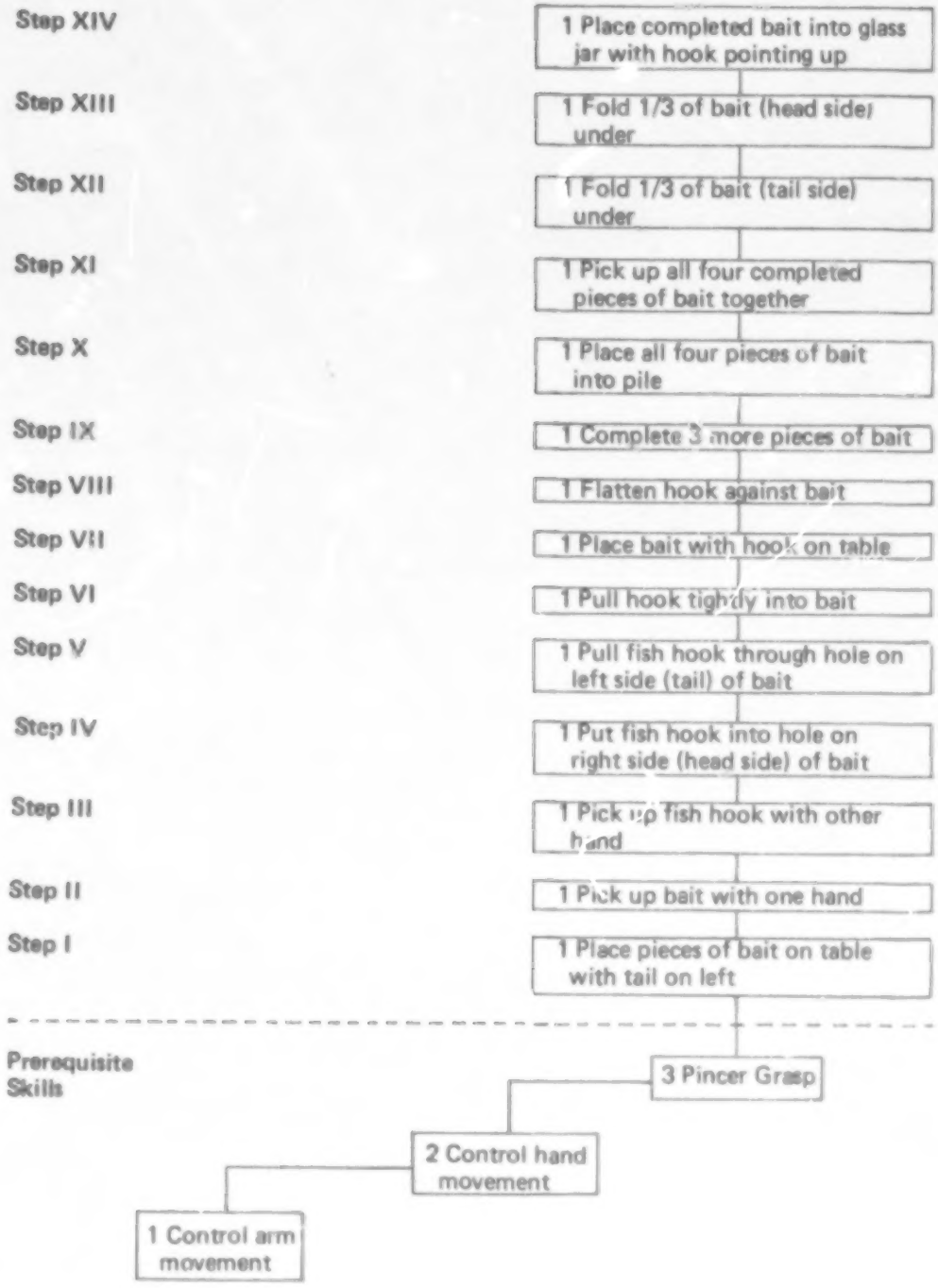

Step XIV
1 Place completed bait into glass jar with hook pointing up
Step XIII
1 Fold 1/3 of bait (head side) under
Step XII
1 Fold 1/3 of bait (tail side) under
Step XI
1 Pick up all four completed pieces of bait together
Step X
1 Place all four pieces of bait into pile
Step IX
1 Complete 3 more pieces of bait
Step VIII
1 Flatten hook against bait
Step VII
1 Place bait with hook on table
Step VI
1 Pull hook tightly into bait
Step V
1 Pull fish hook through hole on left side (tail) of bait
Step IV
1 Put fish hook into hole on right side (head side) of bait
Step III
1 Pick up fish hook with other hand
Step II
1 Pick up bait with one hand
Step I
1 Place pieces of bait on table with tail on left
Prerequisite Skills
3 Pincer Grasp
2 Control hand movement
1 Control arm movement

FIGURE 6

Objective Teaching students to package fish bait: that is, given fish hooks, bait and a glass jar the students should insert fish hooks into bait, pile four completed strings of bait into a pile, fold all four strings (together) into thirds and place the folded bait into a glass jar.

Criterion: The students should correctly assemble 19 out of 20 complete products in an hour.

Prerequisite Skills:

Direct arm movements
Direct hand movements
Pincer grasp

Step I: Teaching students to place pieces of bait on table with tail on left.

Step II: Teaching students to pick up bait with one hand.

Step III: Teaching students to pick up fish hook with other hand.

Step IV: Teaching students to put fish hook into hole on right side (head side) of bait.

Step V: Teaching students to pull fish hook through hole on left side (tail) of bait.

Step VI: Teaching students to pull hook tightly into bait.

Step VII: Teaching students to place bait with hook on table.

Step VIII: Teaching students to flatten hook against bait.

Step IX: Teaching students to complete 3 more pieces of bait.

Step X: Teaching students to place all four pieces of bait into pile.

Step XI: Teaching students to pick up all four completed pieces of bait.

Step XII: Teaching students to fold 1/3 of bait (tail side) under.

Step XIII: Teaching students to fold 1/3 of bait (head side) under.

Step XIV: Teaching students to place completed bait into glass jar with hook pointing up.

Motor Skill: Sitting

1. A motor skills objective could be teaching the students to sit without support; that is when placed in a sitting position on the floor with legs apart and knees bent the students should be able to sit two minutes without support.

When developing and implementing motor skills programs, it is essential to consult occupational and/or physical therapists. Occupational and physical therapists can assess the students' motor skill needs and suggest programs and training procedures. They can help delineate developmentally sound skill sequences which are appropriate to individual student's special motor problems (e.g., cerebral palsy). For information on motor skill development review such references as, "The Baby Exercise Book," Levey (1973); "Handling the Young Cerebral Palsied Child at Home," Finnie (1970); and "The Neuromuscular Maturation of the Human Infant," McGaw (1945). If a developmental skill sequence or commercially available instructional program which precisely fits the students' needs is found, use it. If such a program or skill sequence is not readily available, perform a task analysis to adapt available sequences or create new sequences.

2. When the essential reference work is complete, derive the necessary component skills of the behavioral objective. As described above the component skills of the objective are derived through three processes: 1) listing the component skills suggested by relevant references; 2) asking the question "To master this objective what component skills must the student be able to perform?" until further component skills cannot be derived; and 3) performing the skills required by the objective yourself, observing others perform the skills and imagining yourself performing the skills while noting the necessary component skills and the order of their occurrence. Figure 7 displays a skill sequence for sitting depicted in a lattice.

If the students are to sit unsupported, they should be able to control their heads; that is, balance (compensate for left to right and back and forth movements) their heads while sitting (Phase I, Box 1). For the students to maintain their balance while sitting they should be able to direct their arm movements (e.g., reach) direct their leg movements (e.g., roll over) exert force on their arm and hand (e.g., roll over - crawl) sit with support and use trunk muscles to maintain balance (compensate for left to right and back and forth movements) (Phases II, III, IV, V, VI). Students who have these skills should be ready to learn to sit unsupported (Phase VII).

3. Eliminate unnecessary component skills.

4. Redundant or equivalent component skills should be eliminated.

5. Determine which component skills are prerequisite. In this case the only prerequisite for students entering the program is that the students have no physical disabilities which prevent them from being placed in a sitting position or learning how to sit unsupported.

Figure 8 displays the skill sequence in a vertical list format.

Validation of Task Analyses and Skills Sequences

Precise skill sequences derived through task analyses are more likely to be successful than casual or unplanned task presentation sequences. It must be emphasized that increasingly finer breakdowns of objectives, addition of overlooked component skills and the elimination of unnecessary component skills are constant processes involved in task analyses. That is, you should progress from skill sequences constructed through logical (armchair) analysis of an objective to skill sequences constructed through systematic observations of student progression through sequences. This process involves a progression from a logical task analysis to an empirical task analysis.

Validation of skill sequences requires instructing students while carefully recording each student's performance. This is a time consuming but productive task which often results in the reordering of component skills and the delineation of component skills that had not been identified but which should be included in the skill sequence. Construction of skill sequences through a task analysis

approach is a dynamic process in which it is likely that any given skill sequence will be modified based upon student performance.

The cycle of: task analyze an objective, instruct and monitor student performance, reanalyze the objective, instruct and monitor student performance and so on, is essential to the development of efficient skill sequences. It is only through such research that we can effectively progress from "normal" developmental sequences, logically derived notions of skill sequences, and psychological laboratory research to valid instructional curricula.

Applying Task Analysis in the Classroom

Long-Term Skill Sequences or Extended Task Analyses

It has been possible to empirically verify that severely handicapped individuals can be taught a wide range of arbitrarily selected skills. Through the systematic use of such procedures as positive reinforcement, physical guidance and modeling, such skills as walking *(e.g. O'Brien, Azrin and Bugle, 1972)*, following selected verbal directions *(e.g., Whitman, Azkaras and Chardos 1971)*, selected social skills *(e.g., Whitman, Mercurio and Caponigri, 1970)*, toileting *(e.g., Azrin and Fox, 1971)* and receptive vocabulary, imitation, naming and sentence production *(e.g. Bricker and Bricker 1970)* have been taught severely handicapped individuals.

Unfortunately, most documented reports of programs that have been effective in teaching severely handicapped individuals have been concerned with segmented perceptual motor, self-care, and language skills. That is, the programs do not explicitly delineate that a skill is a segment of a sequence and how the skill is related to other component skills of the sequence. In the past due to limited educational opportunities, almost inevitable placement of severely handicapped citizens in large residential institutions and lack of an effective instructional technology, it was perhaps somewhat acceptable to teach severely handicapped citizens segmented skills. Now, however, severely handicapped students will be enrolled in public school programs for as long as 21 years. Longitudinal public education coupled with more effective instructional technology make it possible for us to delineate long term skill sequences (sequences the completion of which will encompass a student's school age years). Furthermore, the goals of deinstitutionalization and child advocacy make it mandatory that instruction of a skill be justified as a cumulative segment of a longitudinal skill sequence designed to lead students from their current level of functioning towards independent community functioning.

It must be stressed that any time a task analysis is performed portions of long-term skill sequences are delineated. For instance, the task analysis of noun concepts delineated a sequence which started with functional object use, progressed through matching objects to similar objects and terminated with labeling noun concepts. If we had started with a higher level objective, such as providing students with the skills necessary to succeed in college, the task analysis would have been more extended and would have delineated a more extensive skill sequence. Thus, the extent of a skill sequence derived through a task analysis depends on the behavior objectives delineated and the extent to which we delineate all the component skills and sequence them.

Entering Skills - Readiness

Task analyses identify prerequisite (readiness) component skills and depict the hierarchial relationships among the component skills of a behavioral objective. On the basis of task analysis, skill sequences can be delineated which insure that all prerequisite component skills are learned before instruction on any higher order component skill is begun.

Readiness in a task analysis model consists of mastery of the component skills which facilitate the student learning more advanced skills. Within this model a teacher does not simply wait for a student to be "ready" to learn a skill but teaches the requisite component skills. If we had complete skill sequences in all skill areas, we could delineate and teach the readiness skills for any area.

FIGURE 7
Sitting Lattice

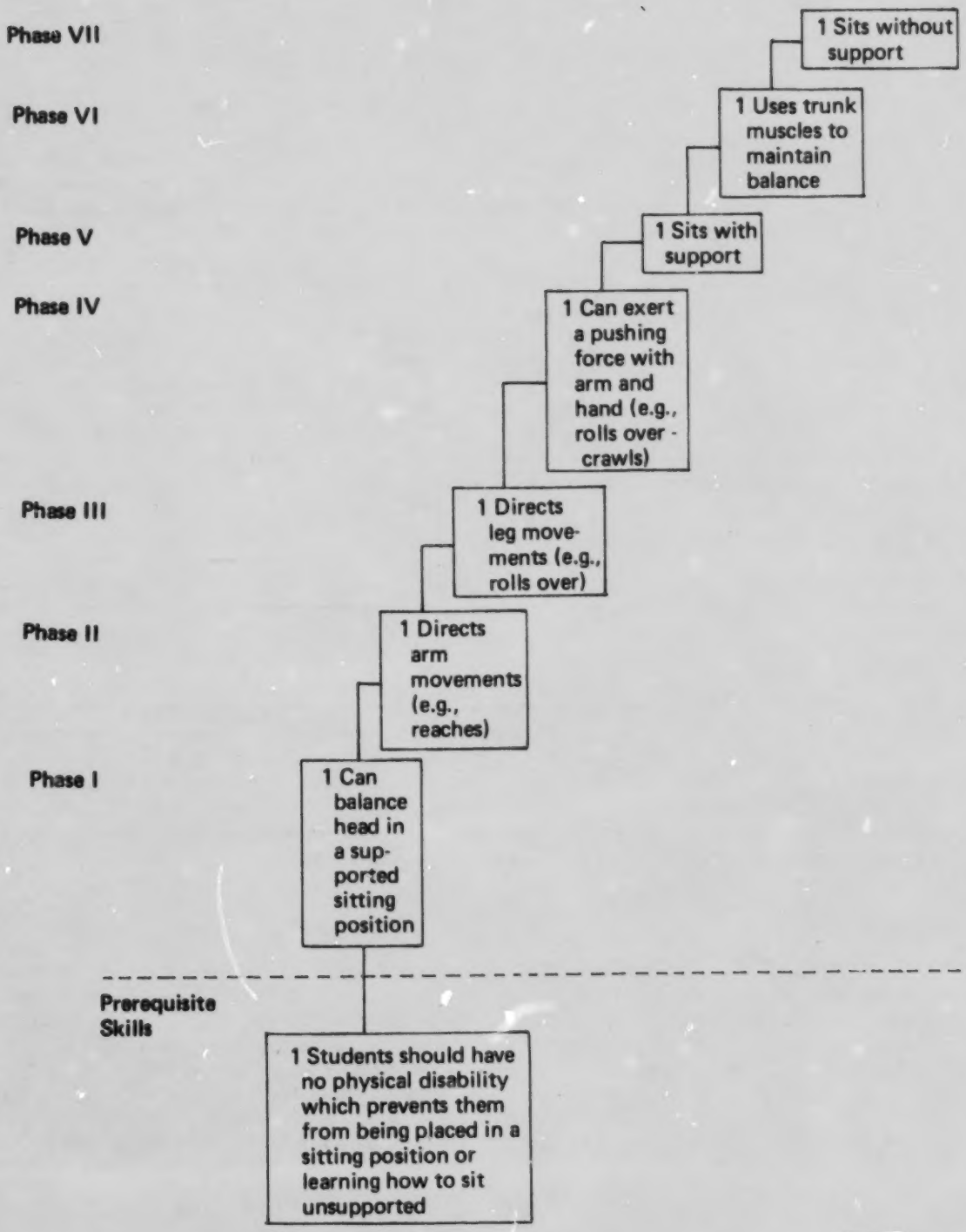

Phase VII
1 Sits without support
Phase VI
1 Uses trunk muscles to maintain balance
Phase V
1 Sits with support
Phase IV
1 Can exert a pushing force with arm and hand (e.g., rolls over - crawls)
Phase III
1 Directs leg movements (e.g., rolls over)
Phase II
1 Directs arm movements (e.g., reaches)
Phase I
1 Can balance head in a supported sitting position
Prerequisite Skills
1 Students should have no physical disability which prevents them from being placed in a sitting position or learning how to sit unsupported

FIGURE 8

Objective - Teaching students to sit without support: that is, when placed in a sitting position on the floor with legs apart and knees bent, the students should be able to sit unsupported.

Criterion: The students should be able to sit unsupported for two minutes.

Prerequisite Skills: Students should have no physical disability which prevents them from being placed in a sitting position or learning how to sit unsupported.

Phase I: Teaching students head control while in a supported sitting position.

Phase II: Teaching students arm control (e.g., reaching).

Phase III: Teaching students leg control (e.g., rolling over).

Phase IV: Teaching students to exert pushing force with arm and hand (e.g. rolling over - crawling).

Phase V: Teaching students to sit with support.

Phase VI: Teaching students to use trunk muscles to maintain balance.

Phase VII: Teaching students to sit without support.

A task analysis and the resulting skill sequence is derived to provide an organized set of learning objectives around which instructional programs of many types may be organized. A skills sequence is *not* a statement of how a task is to be taught or assessed but is a prerequisite to the delineation of specific instructional and measurement procedures.

A skill sequence provides the teacher with a basic notion of how to order task presentations and in what order students learn skills. However, it must be emphasized that students learn more than one skill at a time. They do not necessarily first learn skill A, then learn skill B, then learn skill C. It is more likely that while they are learning skill A they are also starting to learn skills B and C and adjunct skills X and Y. The implication for instruction is if evaluation indicates that the students should be taught skill A, instruction should be concentrated on skill A. However, if feasible skills B and C and adjunct skills X and Y should also be introduced. For example, based upon a skill sequence your first instructional objective could be to teach students to match a cup to another cup and your second objective could be to teach students to label cups. However, while you are concentrating on teaching students to match cups to other cups you should introduce labeling cups and the adjunct information that if cups are dropped, they break; and if cups are tipped, liquid spills. In other words skill sequences delineate key skills and in what order they should be presented but do not limit instruction to only one key skill or the skills delineated.

Use of task analysis and the resulting skill sequences facilitates the individualization of instruction. That is, tests or observational procedures can be designed for each component skill in a sequence. Then students' mastery of various component skills can be assessed before instruction, and they need only be instructed on component skills they lack and for which they have mastered the prerequisites. Grouping of students for instruction can be done on the basis of skills students have mastered and skills they should be taught next. That is, students to be instructed on the same component skill of a skill sequence can be grouped. A precise delineation of the current functioning level of a student on a variety of educationally important dimensions is more relevant to the development of viable instructional services than the use of such descriptions as autistic, severely retarded, trainable, psychotic, emotionally disturbed, and low MA.

The underlying assumption of a skill sequence is that most students learn skills in the same order. However, a skills sequence should be adapted to individual student needs (e.g. motor handicaps, blindness, deafness, muteness). A sequence may be adapted to individual students through: 1) adapting instructional procedures, 2) adapting response requirements, and 3) adapting instructional tasks.

1. Adapting Instructional Procedures

Many instructional procedures and models may be used to teach the same skill. That is, a skill may be taught through participation of all students in highly structured drills, individual instruction, a free school model, a nursery school model, and so on. Procedures and models which are most effective with individual students should be used. However, whatever instructional procedures and models are used the teacher can use skill sequences to monitor student progress.

2. Adapting Response Requirements

Students can demonstrate mastery of a skill or "concept" through a variety of responses. For example, students can demonstrate mastery of the "concept" ball through nonverbal responses (e.g., throwing balls, touching balls, kicking balls, signing, communication boards) and/or verbal responses (e.g., labeling balls, making statements concerning balls). A skill sequence should be adapted to students with specific motor and expressive language problems through allowing students to learn and demonstrate skill mastery through responses they are capable of performing.

3. Adapting Instructional Tasks

A skill may be taught through many tasks. For example, students can learn one-to-one

correspondence through such tasks as giving each place setting a spoon while setting the table, giving each classmate a piece of candy, and so on. A skill should be considered mastered only after students can functionally use the skill to operate on their everyday environment and can perform the skill across people, settings, language cues, and tasks which frequently occur. To facilitate skill mastery the tasks selected to teach a skill through should be chosen on the basis of their: a) functional use to the individual student; b) accessability or frequency of occurrence in the environment of the individual student; c) potential reinforcement value to the individual student; d) facilitation of discrimination learning; e) applicability to repeated practice; f) facilitation of later skill development; and g) facilitation of skill maintenance.

It is unlikely that one task which fulfills all the criteria delineated may be devised. However, use of these three basic tasks should fulfill the task selection criterion: a) functional tasks; b) games; and c) repeated practice tasks.

a. **Functional tasks:** Selecting tasks on the basis of functional use involves teaching skills through functional tasks students frequently encounter. For example, the operation of sorting glasses and silverware can be taught through teaching students to sort glasses and silverware into separate sets at the classroom worktable or sorting glasses and silverware into separate sets while putting away the dishes after lunch. Obviously, sorting while putting away dishes is the more functional task.

b. **Games:** Tasks which facilitate the maintenance and generalization of skills should be selected. Generally, maintenance of skills can be insured through students' repeated practice or use of the skills. Teaching skills through tasks which frequently occur in environments the students inhabit should enhance skill maintenance. Skill maintenance may also be enhanced through devising games or fun activities (e.g., songs, play) which require that students use particular skills. Such games and fun activities should be made a regular component of students' daily programs and free time activities. In addition, games and fun activities have potential reinforcement value to students and thus students are more likely to engage in the activities and use the skills outside of the instructional setting.

c. **Repeated Practice Tasks:** A problem with some functional tasks and games is that they only provide infrequent response opportunities (practice) and do not facilitate discrimination learning. Selecting tasks with continued applicability to repeated practice involves choosing tasks which facilitate discrimination learning and through which the student can be presented many opportunities to respond. This task selection criterion is based on the notion that carefully structured tasks and frequent opportunities to respond typically result in more efficient learning than unstructured tasks and infrequent response opportunities. In some cases repeated practice tasks may have to be used in conjunction with functional tasks and games.

To implement classroom instruction based on a task analysis approach teachers should first delineate ten to fifteen behavioral objectives relevant to the development of their students. Next, each behavioral objective should be task analyzed and skill sequences generated. Then, students should be tested and placed (grouped) along relevant dimensions of the skill sequences. After initial groupings are determined regroupings should be made on the basis of the students' rate of progression through the skill sequence. That is, students should be permitted to proceed through a skill sequence at their pace, taking longer on trouble spots and skipping component skills on which they demonstrate mastery. A formal skill sequence and statements of behavioral objectives can actually permit a greater degree of individualization and flexibility than is possible with other approaches to curriculum development.

TRAINING PROFICIENCY SCALE

A. Shaping Behavior

1. Gets the subject's attention.
   Prior to giving a command, simple or complex, it is necessary for the student to be paying attention to the trainer. Otherwise the command will be wasted. An attempt must be made to find an effective method to obtain and hold the person's attention. Several methods may be used: calling the child's name, clapping your hands or snapping your fingers showing the reinforcers, etc.

Poor	Good
An example of a poor training technique to gain attention would be to call a name in a low voice, or to give a command while the person is walking around the room or attending to other objects.	Good trainers use effective methods to gain attention. Students usually stop what they are doing and listen for a command. Eye contact is a good indicator that the person is attending.

2. Determines the operant level.
   At the beginning of a training session (before any skill is taught) it is to the trainer's advantage to determine the operant level. For example, if a child knows how to remove a pullover shirt and does this on command, it would be very time-consuming and unnecessary for the trainer to go through the various teaching steps. However, if the trainer has been told that this particular child can take off his/her shirt and s/he does not, the usual routine of training may be necessary - apparently this person is not under verbal control which is necessary in teaching new behavior.

Poor	Good
Poor trainers often neglect determining the operant level for many skills. They proceed to teach every skill to every person whether s/he knows it or not.	Good trainers determine the operant level for all skills which s/he plans to teach. This is done before demonstrating the desired behavior, and with a minimum of cues or prompts.

3. Demonstrates the desired behavior.
   In order for a child to learn a new behavior it should be clearly demonstrated to him/her. The trainer, in teaching taking off a shirt,must remove the shirt for the child while s/he is repeating the command. "Johnny, take off your shirt!" emphasizing the word "off." The trainer must be certain that the child sees the desired behavior and hears the correct command before being expected to repeat the task.

Poor	Good
Poor trainers go too fast and do not demonstrate the behavior. Often they do not wait until the person is attending before they demonstrate the particular behavior.	Good trainers demonstrate the desired behavior simultaneously giving the command and rewarding the child. They wait until the person is attending before demonstrating.

4. Starts with the correct step.
   This immediately follows the demonstration of the desired behavior. For example, in backward chaining, the first step taught is the last component step done, i e. the act which

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completes the behavior. When putting on a T-shirt, the last component of the skill is pulling the hem of the shirt down to the waist. This, then, is the first step to teach and should be followed immediately with a reward. Of course, the first step will be dependent on the individual's level of ability and previous training.

Poor	Good
Poor trainers often begin at the wrong step, which is either too difficult or too easy for the student.	Good trainers begin at the correct step and proceed from there.

5. Uses the proper sequence of steps.
Progress is made faster if the proper sequence of steps is followed. In addition, training by more than one trainer is made possible when similar training procedures are followed. For any skill or behavior there are many components. Teaching each one successively increases the child's chances of succeeding and learning usually occurs much faster. It is important to gauge how large the step increments should be for any person.

Poor	Good
Poor trainers treat every person the same. No consideration is given to changing the *size* of the step increments. Often proper order of steps is forgotten.	Good trainers use the proper sequence of steps and adjust them according to the individual needs of each child.

6. Proceeds to the next step when the subject is ready.
After the student has learned the first step of any skill and is able to repeat the step without a physical prompt, the next step can be advanced to. This next step will depend on the person's ability to learn. For example, while one child may be able to throw a ball after a few attempts, another may have to advance to throwing slowly. (Item No. 6 differs from the previous item in that here the rater should be concerned with the proper *timing*, while in Item No. 5 the emphasis is on the knowledge of the steps involved).

Poor	Good
Poor trainers usually proceed too fast or too slowly and students either fail or become distracted.	Good trainers proceed at a effective pace. Students make steady progress in learning each new skill.

7. Returns to previously successful step if necessary.
Three areas should be considered if a student has learned one step after another and then suddenly will not follow through with the next step: (1) Is the reinforcement strong enough? (2) Is the person feeling well? (3) Has the person's tolerance level in this session been reached? A fourth possibility is that the particular step increment is too large for the person to succeed. If this is the case, the trainer should return to a previously successful step (the one immediately preceeding the failed step), allow the student to repeat it, reward him/her, and then proceed to the next step, perhaps using smaller increments this time.

Poor	Good
Poor trainers often fail to return to earlier steps and continue to command the person despite continuing failures.	Good trainers will return to a previously successful step when other possibilities for poor performance have been ruled out.

B. Rewarding

8. Finds an effective reward.
The importance of finding an effective reward is obvious. The more effective a reward is, the

more a child will work for it - in fact, the measure of a reward's effectiveness is the effort which a person expends to get it. In the beginning of a training session primary reinforcements are usually the most effective forms of rewards. Later social reinforcement can be substituted.

Poor	Good
Poor trainers usually use the same rewards with all students and don't experiment until they find the most effective one.	Good trainers usually have a number of different rewards and are prepared to find the most effective one. This is usually determined before training starts.

9. Gives the reward quickly.
   Learning requires that the response and the reinforcement occur in close temporal proximity - that is, they occur closely together. This means that the reward should follow the desired response as quickly as possible - one to two seconds is a good estimate.

Poor	Good
Poor trainers usually fumble with the rewards, dropping them, forgetting to give them, and giving them slowly.	Good trainers usually have their rewards close at hand and give them quickly and smoothly.

10. Gives verbal reinforcement enthusiastically.
    Retarded children experience little success, so accentuating what success they do make is important. Verbal reinforcement (e.g., "Good boy") should be given in a dramatic fashion. It must also be given in conjunction with the primary reinforcement (food) and serves as a "bridging signal" between the response and the reward. In other words it is sometimes difficult to give the primary reinforcement immediately after the response: however, it is almost always possible to praise the child. This way, verbal praise becomes associated with the primary reinforcement and later can be used in its place.

Poor	Good
Poor trainers are apt to forget to give verbal reinforcement, or give it in a mechanical manner.	Good trainers have a flair for dramatics. Verbal praise is given with changes in loudness and tone, with much inflexion.

11. Gives verbal reinforcement with primary reinforcement.
    As was said above (Item No. 10) it is important that verbal praise be given immediately after the response, and thus can serve as a bridging signal. Verbal praise can then be used instead of treats since it has been associated with them in the past. This is an important step in the child's development because it represents the acquisition of a basic receptive vocabulary.

Poor	Good
Poor trainers often forget to give praise, or if they do, the delay between praise and the treat is too long. Sometimes the praise follows the treat instead of coming before it.	Good trainers give praise immediately after the desired response and before the treat.

12. Gives physical reinforcement enthusiastically.
    Most retarded children like physical contact (though there are exceptions). For most children it is very effective to give physical reinforcement by patting them softly on the back, rubbing their backs, giving them a short swing, etc. Like verbal reinforcement, it should be given with the primary reinforcement. In short, you try to reward the child in as many ways as possible at the same time, with a treat, by praise and with physical contact. *Always,* individual differences between children must be taken into account.

Poor	Good
Poor trainers often forget to give physical reinforcement, or give it mechanically.	Good trainers give physical reinforcement initially following every desired response.

13. Gives physical reinforcement with primary reinforcement.
As in the case of praise (Item Nos. 10 & 11) it is important that physical reinforcement be associated with the primary reinforcement. In those cases where the physical contact is already reinforcing to the child this presents no problem. In cases where the child is afraid of physical contact, association with primary reinforcements is essential. Without physical contact, training is very difficult, and adjustment to everyday life situations is impossible.

Poor	Good
Poor trainers often forget to give physical reinforcement, or the delay between the physical contact and the treat is too long.	Good trainers give physical contact immediately after the desired response, and in conjunction with praise. Both are given before the treats.

14. Uses the bridging signal in chaining.
Once a child is responding to verbal praise, it can be substituted for treats. In a simple task, like asking a child to sit down in a chair on the other side of the room, one can first ask the child to "Come to me" then give praise ("Good") followed by the next command "Sit over there" (pointing to the chair) and then give the treat for the completed response. This chain looks like:

"Good" "Good" plus treat

"Come to me" - - - - - "Sit over there"

Here the verbal praise has been used in a situation which before had required the treat. Of course, the time to begin using praise in establishing chains of responses will differ with each child.

Poor	Good
Poor trainers will begin using praise in chaining too early or too late. Sometimes they never even use it.	Good trainers use praise and substitute it once responses have been well established. Usually the child reacts normally to this change when it is introduced correctly.

15. Changes the reward if necessary.
Sometimes in the middle of a training session the child becomes increasingly distractible and stops working. There may be a number of causes for this (Item No. 7), one of which may be that the reward is no longer effective. Retarded children, like the rest of us become tired of the same thing - this is called satiation. If this is the case, a variety of rewards should be tried.

Poor	Good
Poor trainers usually don't remember this important variable and end a session before considering it.	Good trainers take all of the possible reasons for poor performance into consideration.

16. Withholds reinforcement correctly.
It is important to decide what the desired response will be before starting. This way it is clear which responses will be rewarding and which will not. For example, in taking off a pullover shirt, the first response may be holding the shirt. When the child does this s/he is rewarded. The next response would be holding the shirt and pulling it off the end of the arm. Now the child is not rewarded for just holding the shirt. Reinforcement must be

withheld until the desired response occurs. If it does not, it is usually appropriate to say to the child "No" and then repeat the command. Removing the reward from his/her sight with the word "No" is often effective. As always, you should be sure that the step which you are requiring is not too great for the child.

Poor	Good
Poor trainers are hesitant to withhold rewards. Often they forget to say "No" or to remove the reward from sight when the child is not responding appropriately.	Good trainers correctly withhold the reward then the child doesn't respond correctly. They always inform the child by saying "No" and removing the reward from sight momentarily.

17. Gives reinforcement correctly.
Of course, it is vital that reinforcement be given correctly. A child is rewarded when s/he emits a desired behavior. As has been said, there are individual differences between children and in the same child from time to time. This means that the trainer must adjust that response to the conditions of the training session. Nonetheless, the child must be rewarded for desired responses, and must not be rewarded for undesirable behaviors. A trainer should be able to justify each reward given a child according to the goals of a particular training session.

Poor	Good
Poor trainers sometimes reward inappropriate behaviors, or they forget to reward the appropriate responses.	Good trainers know what responses to expect and reward them when they occur. They do not reward inappropriate or undesirable behaviors.

C. Communicating

18. Uses the correct emphasis in commands.
It is often difficult for retarded children to understand words. There may be little difference for the child between the words "Take off your shirt" and "Put on your shirt." For this reason it is beneficial to emphasize the action words "off" and "on" in the above case.

Poor	Good
Poor trainers generally speak in a mechanical manner not emphasizing any words in particular, or they emphasize the wrong words - "Take off your shirt."	Good trainers have that dramatic flair and use it to accentuate the important words in each command.

19. Uses correct verbal commands.
In order to allow different trainers to work with the same child and not create difficulties in transfer of training, a standard language should be used. This makes it much easier for the child. For example, if one trainer says "Take off your shirt" while another says "Give me your blouse" the child is likely to get confused.

Poor	Good
Poor trainers often use different commands during the same training session.	Good trainers generally use a standard language in all situations with all children; however, they will vary the language when it becomes necessary.

20. Uses student's name before command.
Not only is it important to use the proper standard language emphasizing the important

words, but it is also necessary to introduce commands with the student's name. This is one effective way of getting his/her attention. Otherwise, the command is wasted since it may have been completed before the child was listening. This also can serve as an important learning process for the child, where every command reinforces a rudimentary self-concept. Initially it is sometimes necessary to train a child to respond to his/her own name.

Poor	Good
Poor trainers often make the mistake of putting the child's name after the command.	Good trainers always use the child's name first.

21. Gives correct gesture.
Sometimes it is not enough to give a retarded child a command. When commands are not sufficient they should be accompanied by gestures. If you are asking Johnny to "Come to me" and he has not responded to the verbal command, it is helpful to use your arms and hands and gesture. This is particularly useful when working on dressing skills and you are using the same word (shirt, pants) in giving commands which may call for opposite actions (off, on). It is very important that the gesture be given simultaneously with the command.

Poor	Good
Poor trainers either do not use gestures or use them incorrectly. Sometimes they are given after the command, or they are not sufficiently dramatic to be effective.	Good trainers first determine whether a gesture is necessary, and if so, use it correctly, simultaneously with the command, and with sufficient dramatization.

22. Gives physical prompts effectively.
When commands plus gestures have not worked, and the child is still not obeying a simple command, it may be necessary to physically move the child's body and limbs, and then use reinforcement. In asking a child to "Sit down" you may at first have to sit the child down by pushing down on his/her shoulders. Similarly, in dressing, an occasional move of the arm may be necessary to get a child started.

Poor	Good
Poor trainers use physical prompts incorrectly by too much or too little emphasis. Sometimes they do not even use them at all.	Good trainers use physical prompts when commands and gestures have failed. They use sufficient emphasis to produce the behavior without irritating the child.

23. Fades physical prompts correctly.
Physical prompts may be necessary to initiate a skill but they are rarely necessary for long periods of time. In addition, they may be time-consuming. The sooner a physical prompt is eliminated the faster training progresses. Physical prompts are correctly faded by gradually reducing the physical assistance given by the trainer. Initially it may be necessary to put both arms on the child's shoulders to sit him/her down; then, maybe one arm. Later it may be enough to put your arm to his/her shoulder to get the child to sit. It is very important that the physical prompts be removed gradually.

Poor	Good
Poor trainers usually do not fade physical prompts, but rather stop using them abruptly.	Good trainers gradually fade the physical prompt providing a smooth transition.

24. Fades gestures correctly.
Once physical prompts have been faded, and the child is responding consistently, gestures can also be eliminated. Remember, the goal is to have the child under verbal control. As

with physical prompts, gestures are not simply dropped, they are gradually reduced. Usually this amounts to going from large movements to smaller movements.

Poor	Good
Poor trainers usually stop the gestures abruptly.	Good trainers gradually decrease the size of gestures.

D. Rapport and Miscellaneous

25. Gets acquainted before training.
A training session is an intimate interpersonal relationship between the student and trainer. This is important to keep in mind. Much of the success in training will be related to the feeling which the student has toward the trainer. Since the training session may be new to the child, you should first become acquainted. Let him/her walk around the room. Touch and let the child touch you. Once the child is relaxed in the situation, you can begin training.

Poor	Good
Poor trainers begin training as soon as the student enters the room.	Good trainers take time to get acquainted before training. The first session may be devoted only to this.

26. Shows adequate patience during training.
A training session can be a very tiring experience for the trainer as well as the child. Sometimes everything goes well, and sometimes it doesn't. When it doesn't, the trainer often becomes irritable and loses patience with the child.

Poor	Good
Poor trainers often lose their patience and become irritated.	Good trainers stay calm in most situations, and know when it is time to end the session.

27. Handles children respectfully.
Retarded children are like any other human being and deserve to be treated with respect. Respect can be shown in various ways: in your voice, in the way you touch a child, in the things you say, etc. Pushing or shoving a child, referring to him/her in derogatory names, yelling, etc. are indications of a lack of respect for the student as a person.

Poor	Good
Poor trainers are likely to call a student names, dislike physical contact, etc.	Good trainers treat the student as another human being.

28. Properly ignores inappropriate behavior.
Often in a training session a child responds negatively. Misbehavior may occur in a variety of ways: by throwing objects, screaming, banging head, spitting, soiling, etc. It is usually best to ignore this behavior because paying attention might reinforce these responses and the behavior would continue.

Poor	Good
Poor trainers are overconcerned with misbehavior. Training is constantly stopped to reprimand the student.	Good trainers ignore most bad behaviors unless it becomes absolutely necessary to terminate a session.

29. Prepares room correctly before training.
The environment in which training occurs is also an important factor to be taken into consideration. If you plan to work on dressing skills it makes sense that you have clothes in the room before you begin, or at least, that you bring them in with the child. It is also important to have whatever props you may need, such as a chair, table, etc. Any distractions should be eliminated if possible.

Poor	Good
Poor trainers get the child and then think about what they need. Their rooms are often filled with unnecessary distractions, without the proper rewards, props, etc.	Good trainers prepare their rooms before beginning, and have the right props, a variety of rewards on hand, and have eliminated as many distractions as possible.

30. Trains one task at a time.
Retarded students learn slowly, and it is important for the trainer to be persistent. It may be necessary to work at one skill for a long time before the child begins to respond properly. For this reason trainers should generally work on one skill at a time, since this increases the student's chances of success.

Poor	Good
Poor trainers skip from one task to another.	Good trainers work on one task until the child has experienced success.

DISCRIMINATION LEARNING

Marc W. Gold and Keith G. Scott

The retarded child is surrounded with a variable environment and from it s/he must select those features that are relevant to the activities in which s/he is engaged. This means some events must be attended to while others are ignored. One of the characteristics of the retarded is a reduced ability to independently select the relevant aspects of a task. Their teachers must arrange the educational environment first to attract the child's attention to the relevant aspects of tasks and second to help the child learn to do this for him or herself. This chapter is concerned with ways to accomplish these goals.

General Principles of Attention

Before we turn to specific training procedures it is necessary to define terms and principles relevant to discrimination learning. The theory behind these ideas is the extensively researched Attention Theory of Zeaman and House (Zeaman, 1965). Attention refers to the process by which a child focuses on some aspects of the stimuli to which s/he is exposed (Zeaman and House, 1963). *Attention in this context, and in this chapter is concerned with what the child looks at rather than the length of time a child spends doing something.*

Discrimination and generalization

All learning requires that the child detect some differences in the events s/he hears sees, or touches. Thus, in learning to recognize letters the child must discriminate differences in position of the vertical stroke to discriminate a *d* from a *b*. Similarly, some aspects of the letters must be ignored such as the slope *b* and *d* In a social setting the child learns to attend to certain physical characterisitcs such as body shape and facial features to discriminate men from women. With current fashions and styles some features such as length of hair must be ignored. Learning to detect the relevant dimensions of variation is necessary before the child can respond to differences. In our examples this would involve saying *b* or *d* or responding in the socially appropriate way to a man or a woman.

Once a child has acquired a discrimination s/he must learn to transfer the training. The discrimination must be generalizable to new situations. Thus, having learned to discriminate between one male and one female, the child must *generalize* his/her learning to apply to other individuals as well. However, the generalization may be too great. Behavior that is the appropriate social response to a young woman teacher might not be appropriate with an older woman or grandmother. If the child gave the same response to all people regardless of age or sex we would say that the child had *overgeneralized* and was not discriminating. At first the young child commonly calls all men "Daddy." S/he had learned to discriminate men from women but overgeneralizes in attaching the label to all men. Later s/he will learn that some men are daddies and others are not, and that one particular daddy is his/or hers. Further, "My Daddy" is a particular person who may wear different clothes and sometimes be pleased and sometimes angry. Despite these variations in mood and appearance he is still "My Daddy." Generalization needs to be sufficiently broad to permit acceptance of unimportant or irrelevant details about Daddy while other critical aspects can be sharply discriminated so that he is not confused with other men. *We need to engineer the pupil's attention so that s/he learns to attend to those aspects of the situation that are relevant to his/her learning and to ignore those that are irrelevant (Scott, 1966).*

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There are two important kinds of stimulus variation to consider in engineering a pupil's attention and discrimination. First, there is simple discrimination. Here a child who learns to discriminate red from green may at first overgeneralize and confuse red and orange. With repeated training where only red is reinforced this confusion will be removed. However, in other ways the child's learning one color discrimination will also aid in learning other color discriminations. The child learns that there are also systematic dimensions of variation in the world. This second kind of stimulus variation is called *mediated generalization.* Not only does the child distinguish between the particular colors red and green, s/he also learns that color is a dimension on which things in the world vary. As s/he plays with blocks the child learns that one way to sort them is in terms of their color. Another way to sort the blocks is in terms of their form or shape. The child, in making a discrimination, must learn to attend to the dimensions on which things differ as well as, and perhaps before, s/he can see differences between particular stimuli within those dimensions. S/he must learn the dimensions of difference that are relevant to discriminations among people, among blocks, or among letters and words.

Attention Theory

A major postulate of attention theories of discrimination learning has been that solving a discrimination consists of learning a chain of two responses (Zeaman and House, 1963). *First the child must learn to attend to the relevant dimension of difference between the stimuli and then choose the particular stimulus that is correct.* An apparatus, called Wisconsin General Test Apparatus, shown in Figure 1, has been used in the laboratory to investigate this result. With this apparatus the tester sits behind a one-way vision screen and arranges two stimuli, e.g., a red square and a green square, so that they cover two holes in the sliding tray. Under one of the color squares is hidden a small reward object such as a candy. The tester slides the tray forward and the child now tries to find the candy by moving one of the squares to uncover the hole. The child, to be scored correct, must find the candy on the first try.

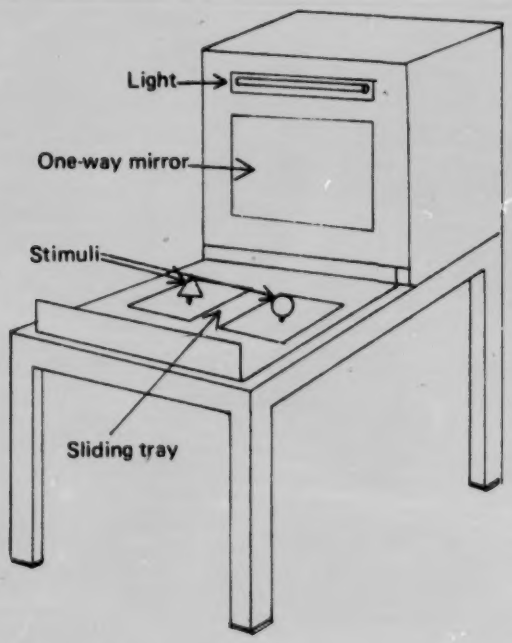


Figure 1 The Wisconsin General Test Appartus, or WGTA

The traditional view of learning was that the child acquired the discrimination between the red and green stimuli slowly by building up little increments of habit. In this view, retarded children's slowness in acquiring habits is due to their acquiring smaller than normal increments each time they make a correct choice and are reinforced (Scott, 1970). This view of normal-retardate differences is illustrated by the hypothetical curves, shown in Figure 2, which show learning of a habit as gradual and incremental. Research in discrimination learning has shown that learning is not a matter of building up little bits of habit, and that these curves, commonly seen in some older writings, are created by inappropriate methods of grouping data which mask the shape of the individual curves (Zeaman and House, 1963).

A more accurate view of the course of learning and of the difference between normal and retardate learning is shown in Figure 3.

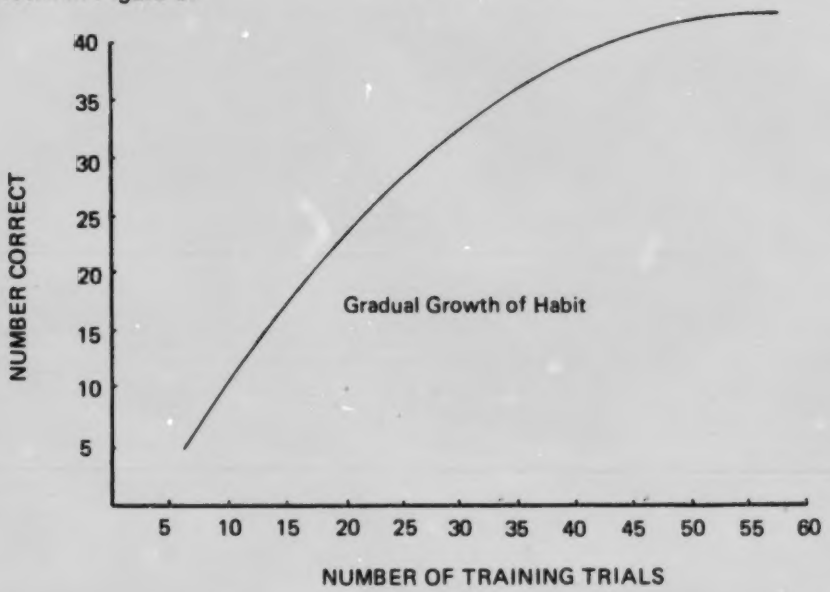


Figure 2 Schematic diagram of the course of learning when the growth of a habit is seen as gradual. The curve should be compared with those in Figure 3, which are more representative of the performance of an individual subject.

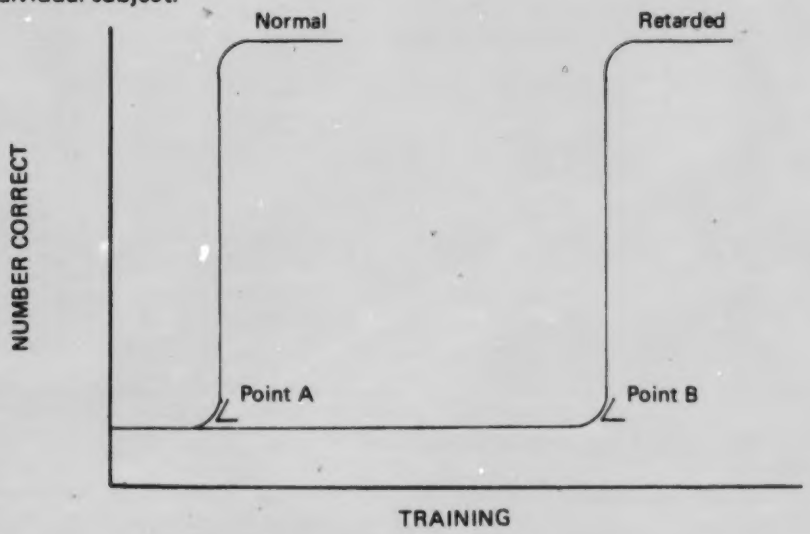


Figure 3 The course of learning for normal and retarded children as training progresses. As can be seen, after they reach a critical point, i.e., attend to the relevant stimuli, the children learn at the same rate (A for the normals and B for the retarded). The diagrams are schematic.

Here we see that *learning consists of an initial period of responding at chance followed by a sudden onset of learning, or a point* (labeled A and B in Figure 3) *where the child makes an insightful solution to the problem.* An important point can be seen in Figure 3. *The difference between normal and retarded children lies not in the rate at which performance increases but rather in the length of time it takes the retarded child to reach the point where he begins to learn.* More detailed analyses of data show very clearly that the retarded child takes longer to attend to the relevant dimension, and thus begin learning, than does a normal child (Zeaman, 1965).

Once the retarded child attends to the relevant dimension s/he learns very rapidly and essentially at the same rate as a normal peer. It follows that a large part of the teacher's job in facilitating the learning of retarded children consists of arranging the teaching material so as to direct the child's attention to the relevant dimensions of the problem.

Dimensions and shifts

A useful way to conceive of a dimension is as a meaningfully related group of items. Thus, the various colors——red, green, blue, orange, and so on——make up the color dimension. As learning theorists study learning about groups such as animals (e.g., bird, bear, dog, and so on), they have often called the groups or dimensions "clusters." The general point is that to make learning about things efficient the adult or child must achieve some organization of the material into effective groupings. This has at least two major effects. First, it allows the child to focus on the critical features by directing his or her attention to what is relevant. Second, in remembering the material later it provides for direction of his/her memory search.

When a child learns one color discrimination and subsequently is taught another but different color discrimination, learning of the second problem is much faster than of the first. That is in learning the first discrimination s/he learns both that color is a relevant dimension and which particular color is correct. In learning the second problem, since s/he is already attending to the color dimension, the child has only to learn to pick which of the new colors is correct. The second problem is then said to involve a shift of attention within a dimension and is called an *intradimensional shift.* If the second problem involves a shift of attention to a new dimension, such as form, it would be described as an *extradimensional shift* (Wolff, 1967). In Figure 4 schematic learning curves are shown for children who, having learned one discrimination, are now learning a second discrimination. The solid line would represent the curve for a child who, having learned one color problem, is now learning another color problem (intradimensional shift). The dotted curve is for a child who, having learned one color problem, is now learning a form problem (extradimensional shift). As can be seen, when the second problem is solved using the same dimension as the first, learning is much faster.

Some Specific Concepts About Attention

Redundancy

Sometimes a problem can be learned in more than one way. Such problems are said to be *redundant.* An example would be the discrimination between a red square (the correct choice) and a green triangle. A perfect solution could be achieved by selecting the red object without looking at its shape. Alternatively, a perfect solution could be made by selecting the square while ignoring the color. When two dimensions or stimuli are always together they are thus said to be *redundant.*

Different effects of redundancy have been investigated (Zeaman, 1968). One important finding is that learning occurs more rapidly as the number of redundant relevant dimensions increases. The more cues a student has to help solve a problem (within reason) the faster s/he will solve it. A child will learn to pick the large, yellow triangle more quickly than to pick the triangle. Having three relevant and redundant dimensions makes the task easier.

Irrelevant cues

Related to redundancy is the finding that when variable irrelevant dimensions are fewer, the child will learn more quickly (Zeaman, 1965). Irrelevant dimensions may be variable or constant. If a child is learning a problem where form only is relevant, then all other dimensions are irrelevant. If all of the forms (stimuli) are the same color and size, then color and size are *constant* and *irrelevant*. If the forms are different colors and sizes and change for each form from trial to trial, then color and size are *variable* and *irrelevant*. If the child is learning to discriminate triangle from square, then having different colors and sizes of triangles and squares would impede learning. Having all triangles and squares the same color and size would not get rid of the color and size dimensions. However holding them constant does not impede learning. *In summary, retarded children can take advantage of more than one relevant and redundant cue at a time to help solve a problem. They also learn faster when irrelevant information is kept to a minimum.*

Fading

One other use of cue redundancy occurs in a technique called *fading* (Terrace, 1966; Moore and Goldiamond, 1964). Here an already established discrimination is used as a crutch to aid in the acquisition of a new and more difficult discrimination. For example, let us suppose that a child can already distinguish between a red and a yellow stimulus but cannot do this for a circle and an ellipse. At the start of training both colors and forms are made redundant. That is, the circle is always yellow and the ellipse always red. This problem could be solved by the use of either color or form. At first, knowing the color discrimination, the child will use it to solve the problem. Gradually, through the course of training, the difference between the red and yellow is decreased until both are orange while the forms remain constant. If the rate at which the crutch cues (colors) are faded is not too great, then the child will proceed through the course of learning with few or no errors. This procedure is thought to minimize frustration and is one method of facilitating the acquisition of difficult tasks. When using fading, one should also avoid fading so slowly that time is wasted and the child is put through many unnecessary and boring trials.

Clustering

The way in which stimuli are grouped can affect the ease with which they are learned and remembered. Thus in learning lists of words, items that belong to a category or *cluster* are more readily recalled (Bousfield, 1953). For example, a list of words that consists only of animals vehicles, or people's names would be recalled better than a list of unrelated words. Children or adults tend to remember by grouping words from the same category. In order for this powerful facilitator of remembering to operate the child must, of course, possess the concept that the items do belong to a class or group. It can be seen that this process, called *clustering,* has much in common with the concept of a dimension. To cluster is much like attending to the relevant dimension.

Criterion

Learning is generally said to have occurred when the child has achieved some criterion of performance. For example, an experimenter might decide that *criterion performance* (learning) for a particular experiment is six consecutive correct responses. This is an arbitrary decision. But when the child makes six consecutive correct responses, the experimenter assumes that the child has learned the task. Whether or not the criterion is appropriate is determined by observing the child's performance following criterion. If there are many errors after criterion, it is an indication that the experimenter's criterion was not appropraite and that learning, or the elimination of errors has not taken place. In such a case, the criterion would be changed and reevaluated.

Overlearning

A concept closely related to criterion is overlearning. *Overlearning* is defined as trials beyond criterion. This does not mean correct trials only. However, frequent errors in overlearning usually indicate that a too weak criterion has been selected. Overlearning is important in two ways. First retention is greatly influenced by the degree of original learning (Belmont, 1966). That is, if a child is brought to a strong criterion and/or is given some degree of overlearning, this will increase his/her

retention of the material. Second, overlearning facilitates transfer on an intradimensional shift. This means that the child who gets overlearning on a problem where the form dimension is relevant will rapidly learn subsequent form problems even though the specific forms change.

Easy-to-hard sequences

Another finding from research on discrimination learning involves the use of easy-to-hard sequences. *A sequence of easy-to-hard problems is learned more quickly than hard problems alone* (House and Zeaman, 1960; Zeaman and House, 1963). If, for example, you wanted a child to learn to sort a pile of two different-length bolts where the difference was one-eighth inch, s/he would learn best by starting with a pile of bolts where the difference in length was one-half inch, then moving to a one-fourth inch difference, then one-eighth. This procedure helps the child identify the relevant dimension, length, because s/he starts out with large differences on that dimension. When the differences get smaller s/he will be attending to the relevant dimension, greatly increasing his/her chances of solving the problem. The child who must learn to attend to a dimension where the differences are small to begin with has a much more difficult problem to solve (Shepp and Zeaman, 1966).

Failure sets

Still another important finding is the powerful detrimental effect of failure sets. Retarded children who experience prolonged failure on difficult problems often will fail to solve even very simple problems (Zeaman, 1965).

This formation of a *failure set* is the result of the child's ceasing to attend to any of the relevant cues in the learning situation. Thus when the teacher or experimenter makes some change in the problem to bring it within the child's ability, it makes no difference. The child is not oriented to the task and does not observe the change. Materials and procedures should be programmed so as to minimize the child's experience of failure. The technique described in the lesson plans that follow illustrate some methods of attack. Also, when the child makes the wrong choice from two or more possibilities, s/he should be told to try another way instead of being told s/he is wrong (Gold, 1969). This method emphasizes where the child can go to succeed instead of where s/he has failed.

Novelty

Most teachers are well aware of the attention-attracting features of a novel event. *Novelty* is a powerful controlling variable in directing attention and can be defined as some discrepant occurrence in a pattern or sequence of events or stimuli. Children who have formed deep failure sets will sometimes start to attend to a novel stimulus suddenly introduced in the series of learning trials. In general, unless an adequate level of stimulus variability is maintained during a training session, children will cease to attend. Often they are said to be "daydreaming" or "bored."

The question then can be asked, What is the optimal level of variability that will maintain attention? (Berlyne, 1960). One clear answer is that the task should differ from what the child has been doing by a margin just wide enough to hold the child's attention. In practice this may be difficult to judge. However, the two extremes——for a task to be either totally repetitive or so difficult that the child cannot solve it——both lead to the extinction of attention and can be readily detected. Unfortunately these extremes frequently are rampant in the workshop and classroom.

Special Training Procedures

Some training techniques which are related to discrimination learning are useful in training the retarded.

Match-to-sample

One such technique is called *match-to-sample* and is sometimes used in discrimination learning experiments (Heal and Bransky, 1966). This technique consists of presenting an object (stimulus) and having the child select from a group of objects (response choices) the one that matches. This technique is not unfamiliar to the classroom teacher. Using some of the concepts described, this procedure can

be used to program many kinds and levels of learning. By controlling the number of relevant and variable irrelevant dimensions a series of easy-to-hard problems is not difficult to achieve.

Oddity

A similar procedure involves *oddity* (Brown, 1970). That is, three or four objects are displayed before the child. All but one of them are alike. S/he has to tell which one is different. The ways in which the stimuli are alike and different can vary greatly. For instance, if you are teaching the concept of male-female, a child might start out with problems where there are two identical pictures of a boy and a picture of a girl. After s/he chooses the odd picture, with sets like these, six consecutive times say, give him/her cards on which there are still two boys and a girl, or vice versa, but where the two alike pictures are not identical. Following successful solution, or criterion, on that set you could change to pictures of adults or pictures where the sex differences are more subtle. The same idea, of course, can be used with the match-to-sample technique. The important thing is to know how to control the relevant and irrelevant dimensions, which in turn do much to control the level of difficulty of the task.

Task analysis and sequencing

The lessons to be described utilize lesson planning rules and concepts such as task analysis and sequencing. *Task analysis* refers to breaking a task down into its component parts. The steps listed in sample Lesson 1 are an example. The concept of task analysis is very important for teaching retarded children. Using task analysis, we find that tasks that are usually seen as consisting of two or three difficult steps are really twenty or thirty simple steps. Examples of this are folding a piece of paper in half, tying shoelaces, walking to the store, and calling the telephone operator in an emergency. *Sequencing* merely refers to putting the steps into a logical order.

A Note on Perceptual-Motor Learning

Tasks such as tying shoelaces are frequently called perceptual-motor. This has been thought to describe the supposed reliance on visual perception of the task details and the use of particular dexterous motor movements. When a child cannot learn such tasks, we usually attribute his/her failure to one or both of two causes. The first is the inability to perceive rather than to discriminate. The second is the failure to make certain movements instead of learn a sequence of movements. *It should be emphasized that most of the moderately retarded have difficulty in learning where to put the lace and when to move the fingers rather than being unable to see the lace holes or to make the component specific movements.* Observation of a child eating will often allow simple confirmation of the child's development. Discrimination between foods of different color and texture can be observed as the child systematically eats one food rather than another. His/her skill in manipulating utensils is also apparent. If the child did not possess the necessary perceptual-motor abilities, s/he could not make the discriminations involved. If such a task is seen as a discrimination learning problem, then we begin to see the task as a sequence of discriminations to be taught rather than relying on some perceptual or motor ability that requires large-scale general training. That is, conceived of in terms of discrimination, the teaching program is one of training a specific task sequence.

The Application of Some Principles in the Sheltered Workshop

The potential of Zeaman and House's Attention Theory was demonstrated recently in a study on the acquisition of a complex assembly task by retarded adolescents by Gold (1969). This was the first reported study utilizing the Zeaman theory in an applied setting. Procedures developed from Attention Theory were used to train sixty-four moderately and severely retarded adolescents with an average IQ of 47, who were enrolled in four sheltered workshops, to assemble a 15-piece and a 24-piece bicycle brake. One-half of the subjects worked with the parts of the 15-piece brake as they came from the factory. That is, in order to decide which way a part went on, the subjects had to attend to the form dimension (the shape of the part). The other subjects worked with parts that were color coded. Coding consisted of painting red that surface of each part that is facing the subject when

22. Release the grasp on that lace.
23. Grasp the two parts of that lace and push the longer part so that it shows between the shorter part and the loop being held in the other grasp.
24. With the forefinger of the hand holding the loop, push the part showing through the hole, letting go with the other grasp.
25. Grasp the end of the long loop.
26. Let go of the grasp that has been close to the shoe since step 11.
27. Grasp the part of the lace which was pushed through the hole in step 17.
28. Pull both loops tight.
29. Let go. (Note:

Many of our friends who know how to tie shoes suggest alternatives to our procedures. May we suggest that you use your own method, but task analyze and teach it using the techniques presented here.)

B. Establish criterion: When the child has tied his/her shoes correctly ten times without help we will assume s/he has learned the task.

C. Decide on ways to direct the child's attention to the relevant dimensions of the problem. Make the two halves of the lace different colors. This will be a cue redundancy because the actual relevant dimension for this task is position——position of the laces and of the fingers. The addition of a color should help. You might also put a black spot on each lace one-third the distance from the shoe to the end of the lace.

D. Decide on a training procedure. The training procedure tells how to teach the task and should not be confused with the steps of the task itself.

1. Teach the child to respond to the command "pinch here," so that before s/he actually begins tying shoes s/he knows how to make a pincer grasp where you say to.
2. Teach the child to respond to the commands "pull tight" and "let go here." For the other movements use as little talking as possible.
3. With the child's shoe on and the laces fairly loose (or with the lacing board) say out loud to yourself, "Pinch here," pointing to a point on one of the laces. Then you make a pincer grasp at that point.
4. Point to the same place, give the same command, and ask the child to do it.
5. When s/he is able to make a pincer grasp at the right point for approximately five consecutive correct times, continue the same procedure for the other commands.
6. In the classroom you would probably begin with Step 4 (grasp a lace end in each hand). Pointing to both laces say, "pull tight" (5). Then, "let go" (6). These two steps are probably best learned together until the child can do them correctly five consecutive times. Then with your commands, tell the child to "do it by yourself" and have him/her do Steps 5 and 6 to a criterion of five consecutive correct times without verbal assistance.
7. On the next trial, when s/he finishes Step 6, say, "hold your hands like this (palms up), pinch here (wait for him/her), and pinch here" (7).
8. Without saying "let go," say "good, let's try that much again." Take the child's hands away from the laces.
9. Tell the child to go ahead (Step 4). Bring him/her to a criterion of five consecutive correct trials where you give the child verbal assistance only on Step 7. Five consecutive trials without any help should follow.
10. On the next trial, with the child grasping the laces, you mimic Step 8 and say "go like this." The purpose of this is to determine which lace the child naturally places in front Once you know this you can show him/her how to do it and watch to see that s/he is consistent. By moving the child's hands, show him/her how to do Step 8. Then, pointing to the top lace, say, "let go here" (9).
11. Again, take the child's hands away from the laces without saying "let go" and use the procedures described in Step 9. Bring him/her to criterion on Steps 4 through 9.
12. Use the same procedures for the rest of the steps.
13. When the child has reached criterion on the entire task, give him/her several days or weeks of overlearning.

14. Then remove the color cue. If the child's performance drops, try using the original procedures, but without the color cue, bringing the child again to criterion.
15. It might be necessary to reinstate the color cue. If so, either give the child more overlearning trials with the color before removing it again, or try using a fading procedure. This might consist of making the two colors more and more alike, or making just the very ends of the laces different colors.

Evaluation: By having a predetermined criterion, you will know if the lessons are successful The teacher must be prepared to make changes in the procedures in order to meet the individual needs of the children. The lesson described is not seen as *the* way to teach children to tie shoes. It is seen as one way. You will have to modify it. The reason the lesson is included in this chapter is to demonstrate how to use some of the techniques and concepts described.

Lesson 2

Purpose: To assist the child in learning to sort bolts into categories of size, length, and head shape.
Materials: Several hundred bolts with the following characteristics:

1. Hexagon head, 1 inch x 3/8 inch (all bolts standard thread)
2. Hexagon head, 1 inch x 1/4 inch
3. Hexagon head, 3/4 inch x 3/8 inch
4. Hexagon head, 3/4 inch x 1/4 inch
5. Hexagon head, 1/2 inch x 3/8 inch
6. Hexagon head, 1/2 inch x 1/4 inch
7. Round head, 1 inch x 3/8 inch
8. Round head, 1 inch x 1/4 inch
9. Round head, 3/4 inch x 3/8 inch
10. Round head, 3/4 inch x 1/4 inch
11. Round head, 1/2 inch x 3/8 inch
12. Round head, 1/2 inch x 1/4 inch

The bolts described have differences on three dimensions——head shape, length, and width.
Techniques and concepts to be illustrated: Criterion, cue redundancy, easy-to-hard sequence.
Procedure:

A. To teach the vocabulary for the bolts and for the directions, refer to the article by Gold (1968).
B. Establish criterion: When the child sorts the pile twice without errors it will be assumed s/he has learned the task that is represented by that pile.
C. Present the child (or children) with a pile containing the hexagonal, 1 inch x 1/4 inch bolts and the round, 1/2 inch x 3/8 bolts. In doing this you have provided a task on which there are three relevant and redundant dimensions.
D. Either use labels and commands the child knows or, nonverbally, remove one kind of bolt and put it in one place (container) and put the other bolt in another container.
E. Ask the child to start. If s/he has difficulty, you start slowly sorting the pile and encourage him/her to do the same.
F. Following criterion, change the task to each of the following establishing criterion each time.

    1. Make all dimensions relevant and redundant. That is, sort hexagonal 1 inch x 3/8 inch from round 1/2 inch x 1/4 inch bolts.
    2. Keep one dimension constant and irrelevant and sort for the other two. That is use one head shape and sort 1 inch x 3/8 inch from 1/2 inch x 1/4 inch bolts. Or use one length and sort hexagonal 1 inch x 1/4 inch from round 1 inch x 3/8 inch bolts.
    3. Keep two dimensions constant and irrelevant and sort for the third. That is sort hexagonal 1 inch x 3/8 inch from hexagonal 1 inch x 1/4 inch bolts and so on.

4. Do steps 1 and 2 above using the 3/4 inch with the 1 inch and/or the 3/8 inch bolts. This will constitute a move toward a finer discrimination.
5. Use all bolts and sort on all relevant dimensions (twelve piles). You might need to start without 3/4 inch bolts. In this case there would be eight piles.
6. Use all the bolts and have variable irrelevant dimensions. That is, sort all of the hexagonal bolts from all of the round bolts. In this case length and width would vary but would not be relevant.
7. Use other combinations, remembering the rules about cue redundancy, relevant and variable irrelevant dimensions, and easy-to-hard sequences.

Evaluation: If the child is able to perform at criterion given any combination of categories, s/he has not only learned to sort bolts but has developed a sorting skill that will transfer to many other tasks.

Summary

Retarded children learn rapidly once they attend to the relevant stimuli and dimensions in a learning situation. A major task of the teacher of the developmentally young is to program the instructional materials in a manner which will direct and maintain attention and thus facilitate learning.

Research on discrimination learning provides a number of key concepts, e.g. the dimensional organization of stimuli, that have led to theories about attention. This theoretical framework in turn provides the teacher with the language, behavioral rules, and techniques to plan carefully sequenced training. Not only is learning made easier for children, but in addition, the teacher is able to avoid unfortunate side effects. e.g., the formation of failure sets.

The procedure is illustrated by a report of research demonstrating the assembly of complex mechanical equipment by retarded adolescents. Also two model lesson plans, and the procedure by which they are developed, are outlined. This chapter thus provides a systematic plan for programming the acquisition of relevant tasks in terms of specific training as an alternative to planning a broad and vague program aimed at "perceptual-motor abilities."

References

Belmont, J. "Long-Term Memory in Mental Retardates." In International Review of Research in Mental Retardation, vol. 1, edited by N. R. Ellis, P. 219-255. New York: Academic Press. 1966.

Berlyne, D. Conflict, Arousal, and Curiosity. New York: McGraw-Hill, 1960.

Bousfield, W. A. "The Occurrence of Clustering in the Recall of Randomly Arranged Associates." Journal of General Psychology. 1953: 229-240.

Brown, A. L. "Subject and Experimental Variables in the Oddity Learning of Normal and Retarded Children." American Journal of Mental Deficiency, 1970 (in press).

Gold, M. "Classroom Techniques: Preworkshop Skills for the Trainable: A Sequential Technique." Education and Training of the Mentally Retarded, 1968, 3, 31-37.

Gold, M. W. "The Acquisition of a Complex Assembly Task by Retarded Adolescents." Final Report, Project No. 8-8060. University of Illinois Champaign-Urbana Library, May 1969.

Heal, L. W., and Bransky, M. L. "The Comparison of Matching-to-Sample with Discrimination Learning in Retardates." American Journal of Mental Deficiency, 1966, 71, 481-485.

House, B., and Zeaman, D. "Transfer of a Discrimination from Objects to Patterns." Journal of Experimental Psychology, 1960, 59, 298-302.

Moore, R., and Goldiamond, I. "Errorless Establishment of Visual Discrimination Using Fading Procedures." Journal of the Experimental Analysis of Behavior, 1964, 7, 269-272.

Scott, K. G. "Engineering Attention: Some Rules for the Classroom." Education and Training of the Mentally Retarded, 1966, 1, 125-129.

Scott, K. G. "Learning and Intelligence." In Psychometric Intelligence, edited by C. Haywood. New York: Appleton-Century-Crofts, 1970 (in press).

Shepp, B., and Zeaman, D. "Discrimination Learning of Size and Brightness by Retardates." Journal of Comparative and Physiological Psychology, 1966, 62, 55-59.

Terrace, H. S. "Stimulus Control." In Operant Behavior: Areas of Research and Application, edited by W. K. Honig, pp. 271-344. New York: Appleton-Century-Crofts, 1966.

Wolff, J. L. "Concept Shift and Discrimination-Reversal Learning in Humans." Psychological Bulletin 1967, 68, 369-408.

Zeaman, D. "Learning Processes of the Mentally Retarded." In The Biosocial Basis of Mental Retardation, edited by S. Osler and R. Cooke, pp. 107-127. Baltimore, Maryland: The Johns Hopkins Press, 1965.

Zeaman, D. "The Law of Redundancy." Paper presented at Gatlinburg Conference on Research and Theory in Mental Retardation, Gatlinburg, Tennessee, March 1968.

Zeaman, D., and House, B. J. "The Role of Attention in Retardate Discrimination Learning." In Handbook of Mental Deficiency, edited by N. R. Ellis, pp. 159-223. New York: McGraw-Hill, 1963.

INDIVIDUAL EDUCATION PLANS

Eugene Edgar

Introduction

This module is intended for use by school personnel responsible for educating severely and profoundly handicapped students. While much of the information contained in it is generic, that is it can be used across disability areas, it is specifically oriented with appropriate examples towards students with severe and profound handicapping conditions.

To set the stage for this discussion the following definitions are offered:

Profoundly handicapped. Any individual exhibiting developmental delays to the inclusive extent that s/he does not ambulate, communicate, engage in self-care activities and does not interact with peers or adults.

Severely handicapped. Individuals who exhibit two of the following three conditions.

1. The individual scores below 30 on an appropriately selected and administered I.Q. measure.
2. The individual does not follow a two-level command statement.
3. The individual does not engage in all self-care activities (including feeding, self-toileting and self-dressing).

Individual Educational Plan (IEP). This is the intermediary step in an educational process that begins with assessment and concludes with program implementation.

To discuss IEP's separately would be useless. We, therefore, will concentrate on all three areas: assessment, IEP development and program plan. Specific examples of a completed IEP and plan sheet will also be presented.

We invite your critique of this module; hopefully with a variety of input from many people it will become more relevant to the needs of the field.

The IEP Mandate

The IEP, mandated under Public Law 94-142, is the first time that federal legislation has intervened into the classroom, legislating an educational planning process for teachers. While the controversy remains unresolved over the rights of the federal government to intervene into this formerly sacrosanct professional domain, we will use the old adage that, the law is law and accept the IEP's as a given.

The IEP's are described in the rules and regulations, Federal Register 41, No. 252, December 30, 1976 in S121A 220-S121A 226. The only interpretation that can be made with regard to this congressional mandate is that the IEP is a teacher, administrator and school system accountability check to translate the federal goal of an "appropriate education for every handicapped child" into reality. The IEP is not a binding contract between the teacher and the child in the sense that one or the other is culpable if the goals of the IEP are not achieved. Rather, it is a discrete planning process designed to systematize the educational planning process into an individualized, child-oriented approach and, to that degree, is a binding contract that the specified services will be delivered. IEP's, under the law, must be written for each child by September of 1977. They must be rewritten and reviewed annually, and each Local Education Agency (LEA) has a one year grace period, until September of 1978, to provide the child with all the services enumerated in his/her IEP. The complications surrounding its implementation, development and evaluation will exist for years However, most special educators will welcome the IEP as a standard process for meeting the unique needs of children.

From "The Experimental Education Training Program – An Inservice Program for Personnel Serving the Severely Handicapped. Norris G. Haring, Editor. Copyright 1977, University of Washington. Reprinted by Permission.

The Rationale

The educational philosophy of special education has recently come under attack. We, in the profession, have not settled upon a clear statement of purpose as to our desired goals for all handicapped children. Cliches such as "develop to full potential," "mainstream into regular education," and "independent living skills" are often bantered about when professionals discuss the outcome of special education for severely/profoundly handicapped children, but seldom are they discussed with any meaningful eye toward definition and implementation. Obviously these terms are too general and cannot be measured.

Most educators will agree that there are five major steps which must be included in the educational process for handicapped children. First, there is an assessment/diagnostic process in which it is determined what the child can and cannot do. From this information a determination is made as to what the child should learn next. Activities are then planned so as to facilitate learning. The plan is then implemented and at some point, child performance is measured in order to evaluate the effectiveness of the entire plan. This process--assessment, goal-setting, planning for instruction, implementation and evaluation--is common to almost all educational strategies for handicapped students. Any good educational program will have these components.

The Individual Educational Plan (IEP) is simply a composite statement of the total plan. Dynamically, the IEP is the midpoint between the gathering of assessment data (the determination of the child's present level of functioning) and the implementation of the educational intervention. By itself, the IEP is meaningless and serves no useful purpose. Viewed as the in-depth planning phase after assessment data has been collected and before intervention begins, the IEP becomes the cornerstone of appropriate educational programming for handicapped children.

Areas of Concern

In reality, almost everything required for the IEP is currently being done by competent teachers. The only major changes are that a committee will be responsible for developing this plan and that all the information is to be recorded in one place. The latter issue, that of recording data in one place does not seem to be a major concern for anyone. However, the idea of a committee functioning for each child has caused considerable concern among professionals in the field. Two points need to be clarified; first, the makeup of the committee. The law clearly states that the minimum membership is to be: (1) the child's referring or present teacher, (2) a representative of the local school district and (3) the parent(s). Additional members, including the child if over 18, may be included (Federal Register, Vol. 41, No. 252, December 30, 1976, p. 56986). However, Section 121a432, (p. 56991) states that the committee contain individuals "knowledgeable about the child, the assessment results, ... "That is, the committee must contain individuals who are competent in interpreting assessment data.

A recurring discussion about IEP's centers on the issues of time and responsibilities. There is some concern that this entire process will demand so much teacher time that there will be a decrease of instructional time. Other complaints have focused on the problems all committees have in reaching agreement and that the committee, in fact, is invading the domain of the teacher. Both of these issues need to be resolved if IEP's are to be practical and effective.

To our way of thinking both these issues can be resolved if two practices are followed. First, members of the committee certainly can work individually before the formal meeting in order to collect information and generate possible ideas for the IEP. Second, the professionals (teachers and LEA personnel) need to truly believe that the parents have a basic right to be involved in their child's education. Undoubtedly there will be instances when parents (or teachers or psychologists, etc.) will impede the process. However, we believe that these will be the exceptions rather than the rule. The committee is, in fact, the most appropriate group to determine a child's instructional plan. The education of severely/profoundly handicapped individuals is an extremely complex task. Not only is little known about this populaton but the expertise of a variety of professionals is needed if the most appropriate education is to be provided. Therefore, true teamwork is essential in developing and implementing programs for these individuals. Even if considerable time is spent in developing the IEP, the results will more than justify this time.

Another major concern about the use of a committee to develop the IEP relates to the scheduling and number of committee meetings. The law allows flexibility to the extent that individuals can be assigned various tasks and the committee need only meet to agree on the final plan. Certainly each individual case must be handled to best facilitate adequate program planning for the child. The intent of the law is clear——a group of responsible, competent individuals will develop each child's IEP. The method by which this is accomplished is left to the discretion of the group.

Components of the IEP

General Considerations

In this section we will enumerate the components of the IEP and present some ideas of what they mean for SPH children. The following sections of "Procedures" will deal in depth with examples of how to write and/or process each of the thirteen components. Each IEP must contain the following components:

1. A summary of present levels of the child's performance.
2. Yearly goals.
3. Recommendations for specific special educational services, including physical education and special media and materials.
4. A statement concerning planned activities with non-handicapped children.
5. Short term objectives for each yearly goal.
6. Evaluation criteria and procedures for each objective and goal.
7. A list of specific educational or support services needed to meet each objective.
8. A list of the persons responsible for implementation of each objective.
9. The beginning and ending date is for each of the listed services.
10. A stated date for re-evaluation of the IEP.
11. Placement recommendation and justification.
12. Signatures of the committee members (and the parents if they are not on the committee) indicating approval of the plan.
13. Dates of all committee meetings.

Summary of Present Level of Performance

The only way in which accurate statements can be made about current levels of performance is to have functional contemporary assessment information. In fact, the entire IEP is completely dependent on accurate assessment information and the appropriate analysis of this data. At a minimu, the current levels of performance for severely/profoundly handicapped children must include data on: gross motor skills, communication skills, social skills, self-help skills, cognitive (pre-academic) skills specific health concerns (medication, seizures, allergies, illness, etc.), physical involvement (positioning), stimulus control, and proven reinforcers. Meaningful educational programming is dependent on these data.

Yearly Goals

The yearly goals for SPH children need to be related to the statement of present level of performance. A primary question must be asked at this point: "What do we want the child to be able to do?" In reality, this question should have also been addressed during the assessment phase. Basically, this idea has to do with the careful consideration of attainable goals and the subsequent programming to reach these goals. Each specific instructional objective and each instructional activity must relate to some future functional behavior. When dealing with this population, no time, not even a moment, can be wasted on nonfunctional activities. The careful selection of meaningful pertinent yearly goals is the major safeguard preventing inappropriate instruction.

Recommendations for Specific Special Educational Services

This component provides the committee with the opportunity to list all special services that are needed to meet the child's specific needs. Certainly occupational and physical therapy and communication skill building are two critical areas for SPH individuals which will probably be noted in every IEP. Any special materials (especially, adaptive equipment) or media (braille or hearing devices)

should also be noted. This law is very precise in stating that a specific physical education program should also be included here. According to the definition of physical education in 94-142 (p. 56978) physical and occupational therapy may be considered commensurate with physical education.

Planned Activities with the "Non-Handicapped"

This requirement simply asks for the committee to put in writing the most optimal situation for integrating the handicapped child with the non-handicapped. In some cases this might not be possible or appropriate. Each committee, however, should ask the question: "Can this child profit from interactions with the non-handicapped?" If the answer is affirmative, provisions for such interaction should be specified.

Short Term Objectives

Specific short term objectives need to be developed which will lead to the accomplishment of each yearly goal. These objectives should be stated in terms of observable child behavior with specific criteria for success. The specificity and number of these objectives will depend on the frequency of the meetings held by the committee, which must meet annually at a minimum.

Evaluation Criteria and Procedures for Each Objective

The precise method and criteria for evaluating each objective must be specified. Good behavioral objectives, by definition, include this information. Each objective should include exactly what the child will do, to what observable criteria, under specific circumstances. The persons responsible for collecting this evaluation data should be the individuals who are responsible for implementing the program (teachers, therapists). However, the entire committee needs to review this data at their re-evaluation conferences.

Specific Educational and Support Services for Each Objective

For each objective there must be a corresponding list of the services required to meet these objectives. Although detailed teaching plans are not included at this point, these statements should include such things as special programs, materials or types of special services (OT, language training, etc.).

List of Persons Responsible for Implementing Each Objective

Each objective must include the name of the individual who has the major responsibility for implementing that objective.

Beginning and Ending Dates of Services

The beginning and ending date for each special service and for each short term objective must be recorded in the IEP.

Re-evaluation Date

Each IEP must include the specific date at which the committee will meet to re-evaluate the IEP. This must be done at least once annually.

Placement and Justification

The committee must make a specific recommendation for placement and provide a justification for this placement over other possible placements.

Committee Signatures

Each IEP must include the signatures of the committee members and the parents stating that the IEP has their approval.

Meeting Dates

The dates for all committee meetings should appear on the IEP.

Procedures: How to Develop an IEP

There are four major procedures that need to be carried out in order to develop an appropriate IEP: (1) the collection of relevant assessment information on the child; (2) deciding on the main priorities for educational intervention (establishing yearly goals); (3) determining how to achieve these goals; and (4) justifying the IEP. The responsibility for these activities is that of the committee. However, the committee does not necessarily have to perform each function nor meet as a group in each phase, but they must agree on each component of the final plan.

Obtaining Assessment Information

As stated previously, the IEP cannot be viewed as an isolated event but rather as part of the total ongoing process of education. Before any instruction can begin, a determination must be made of how the child presently functions. This is typically called initial assessment.

When dealing with this population there are several general areas of assessment information that need to be collected; general health and medical information, physical involvement, considerations for instruction, and specific areas of instructional content.

Medical Assessment.

There can be no substitute for a thorough medical examination. Even though there might be very little that can be done to correct these medical or health problems, they very often influence instructional planning. Therefore, not only must these problems be noted but an interpretation must be made as to how they affect the child's instructional programming. Such matters as seizures medication, heart defects, allergies, susceptibility to illness, strength and stamina, and special feeding instructions are types of assessment information that must be considered in the formation of the IEP. For example, it is extremely important to be aware of any major medical problem which may affect the child's performance in the classroom. Heart defects may require a curtailment of certain types of physical activity or the need for specific rest periods. The possibility of surgical techniques to alleviate physical problems (club foot, cleft palate, leaking heart valve, etc.) must be explored and considered. In the rare cases of degenerative central nervous system diseases, the IEP must focus on the best strategies for maintaining current functioning and retarding the loss of current skills. However, the most common medical information of importance to teachers usually deals with medication. Not only must the types of medications being used be noted, as well as possible side effects, but procedures for conducting controlled studies of varied dosages should also be established. The classroom situation allows for the collection of relevant information on the most appropriate level of medication, especially for seizure control medications.

The basic purpose of this medical information is to enable the development of a comprehensive IEP. Thus, this information must be used to provide for ongoing medical treatment (medications, diet control, seizure control) as well as to determine considerations for educational programming. Specific physical limitations may alter educational priorities (a paralyzed arm, for example, might dictate that instruction will be geared to the good arm and that physical therapy will be given to the immobile arm). Allergies may limit the types of food that can be used as possible reinforcers. The need for rest will certainly be a factor in determining the daily schedule of activities (a child with a serious heart problem might need to have complete rest three or four times a day). All of this information needs to be gathered and summarized in the IEP.

Physical Assessment.

The great majority of severely/profoundly handicapped children are also physically involved. When this is the case, a prime area of assessment needs to focus on this problem in order to determine specific educational goals and to also specify certain procedures as they will affect all areas of the educational program. Positioning, for example, is of prime importance for severely/profoundly handicapped individuals, not only as it may relate to a therapeutic program but also as to how various positions may facilitate or hamper other educational programming. Techniques to relax children who are spastic and strengthen those who are athetoid, procedures for lifting and moving the children, and the possible use of prosthetic devices are all critical pieces of information that must be collected during the assessment phase.

For any child who is experiencing physical problems, the initial assessment information should attend to three major points. First, a competent occupational therapist or physical therapist needs to determine the specific therapeutic needs of the student. These needs, of course, will be built into the IEP as needed special services. Second, the information gained from this evaluation should point out any specific physical limitations of the child that will affect educational programming. For instance, if a PT, OT, or physician determines that a child's legs will never bear weight, walking will probably not be an educational goal. Third, especially for the severely involved child, specific positioning and handling techniques need to be specified. Some children are better able to use their arms and hands if they sit or lie, or depending in what position they are lying. Thus, the OT or PT should be able to determine how to position the child so that the child will be physically best able to make the desired responses. This position should be noted on the IEP as the desired educational position.

In the great majority of instances, OT's or PT's will be used as consultants to the teacher in the classroom. The initial assessment information, therefore, should include specific information on how the teacher and therapist will interact throughout the school year. Information should be included on the types of behaviors that might occur which would demand immediate therapeutic attention. For example, a student with recurring contractions might need a specific therapeutic consultation if the frequency of the contractions increased rapidly over a period of time.

As with the medical assessment information, this physical assessment data needs to be recorded on the IEP both for special program considerations and also to see how it interacts with all educational programming.

Educational Assessment.

The essence of this assessment phase must focus on educational assessment for instructional programming. Although this is a complex issue, several pertinent areas need to be discussed at this point. First, the process of assessment involves teachers looking directly and frequently at specific child behaviors. Second, the materials the teachers use contain procedures for measuring objective behaviors which are sequenced developmentally in various content areas, but always including gross motor, fine motor (or cognitive), communication (language), social and self-help behaviors. Third, the formats in which the materials are presented should be program-specific; that is, they are derived from the specific goals of the educational program.

Because assessment data are used primarily by teachers, they need to be directly involved in designing the procedures for assessment and collection of the assessment data. Since teachers are the primary consumers of educational assessment data and because they are the professionals most involved in educational programming they should be deeply involved in the assessment process itself. The assessment data most beneficial to teachers are those related to actual child behaviors and collected over a period of time.

Direct observation of child behavior provides data which can be interpreted many different ways, but the data should reflect actual occurrences of behavior. By observing children in what is a large part of their natural environment, the teacher collects information concerning child performance on a variety of tasks, under conditions in which the child is typically expected to perform.

The actual assessment materials, although they vary according to specific teachers, should be objective; that is, they should assess specific, observable behaviors. By using already established lists of sequenced behaviors that relate to functional terminal skills, the teacher can pinpoint those skills a child can perform in given skill sequence and determine which skills need to be taught next.

Since the teacher will be the primary data collector, the techniques employed must be usable by teachers in typical classrooms. Although this requirement precludes using many currently available commercial instruments, it is crucial that the teacher be able to collect assessment data in the classroom easily and with minimal interruption of typical classroom procedures.

Although there are a wide range of skill content areas that teachers will assess in their students there appear to be five major categories of behavior that must always be assessed. Gross motor skills (general mobility or ambulation) are prerequisite skills for independent living and general interaction with the environment. Unless the student is absolutely fluent in negotiating his/her environment, gross motor skills must be a primary content area for instruction. Fine motor skills (cognitive, or preacademic, or academic, or prevocational) cover the skills of eye-hand manipulation as well as the

basic academic areas. Obviously these are critical skills, not only in and of themselves but also as building blocks for more advanced survival skills. All human beings need to be able to communicate with other individuals. Both expressive and receptive language skills are priority skills for our students. Self-help skills, especially self-feeding, -grooming, -dressing, and -toileting serve as basic requisites for independent living. Social skills, the ability to interact appropriately with others and including leisure time activities, may be the most critical skills in determining a happy life for these students. In any case, the content areas of instruction need to be assessed by the teacher.

Educational programming should emerge naturally from the collected data. This means that the format should be such that data analysis or re-computation are not necessary before program decisions can be made. If the data collected are not easily interpreted and usable for programming, there is little reason to collect it. The format should provide a step-by-step movement for the teacher and a system which is easy for incoming staff to learn and to use.

Stimulus Control

Before any meaningful program can be developed, stimulus control must be established. Basically, this means that, at the very least, one behavior is under control by the teacher. The response may vary from "look at me," to a touch response or a simple gross motor imitation. Stimulus control is critical for all future educational programming. Before any new response can be trained the teacher has to have control over at least one behavior. This behavior is then used to establish the learning set, e.g., "Kristin, look at me——good, now put the spoon on the spoon . . ." In this case, "Kristin, look at me" is the cue that instruction is about to take place. In fact, this becomes a discriminative stimulus, in that when the requested response is performed reinforcement will follow. In some cases stimulus control might be established around a response that will be used to teach new concepts for example, touching an object. In this case, an object is placed before the child and the command, "Anne, touch the block" is given. The desired response, touching the block, is physically shaped and reinforced until the child responds without physical prompting. This response, touching, can then be used to teach other concepts such as matching or selecting. If stimulus control is not present this becomes a crucial immediate instructional objective. The goal is to simply get one behavior under control. The only time this concept may not be applicable is when working with profoundly handicapped children who have no operant behaviors. In these cases, basic motor manipulation and stimulus input activities are called for until such a behavior can be developed.

Reinforcers

Establishing a proven reinforcer must occur, usually simultaneously, with stimulus control. This task, however, is often very difficult with this population. It is very important to remember that a reinforcer is some event that can be dispensed by the teacher which increases the behavior it follows. Especially with this population we are often too quick to say, "he likes to be touched" or "she smiles when I tickle her" or "socials work well." All such cliches are meaningless unless they do in fact increase the behavior they follow. A recent doctoral dissertation at the University of Washington confirmed what most of us have believed for years; that there is no universal reinforcer for the severely/profoundly handicapped. Under very controlled conditions food (orange juice), social praise (verbal and touch) and movement (rocking) were used with 20 profoundly handicapped children. Each child received each of the three types of reinforcers——with greatly varying effects. The bottom line appears to be this——each child must be treated as an individual and reinforcers must be individually determined. One suggestion is that a reinforcement team should be developed in each center with the prime purpose of determining reinforcers. Various foods, light boxes, vibrators, and other techniques could be tried with each child until a sound, reliable reinforcer has been determined.

There are undoubtedly many other professionals who can provide important assessment information (the CDS, social worker, nurse, psychologist, etc.) but at the very minimum an OT or PT, a physician and the classroom teacher must be involved in obtaining the basic initial assessment information needed to develop the IEP. The format of this information should be three-fold: a clear statement of the child's present level of functioning, a precise list of the next crucial skills to be learned, and specific ideas about programming for these skills.

Determining Priorities

Probably the most important activity of the committee is to analyze the assessment data and establish priority areas of instruction. This particular activity determines the appropriateness or inappropriateness of the IEP. The most technically correct IEP, if focused on inappropriate instructional goals, will result in low quality instruction. The determination of these priorities has been left up to the committee. In fact, there can be no legal mandate in this area as each child needs to be treated individually. By acknowledging this, the committee accepts the responsibility for carefully setting meaningful instructional priorities for each child.

The basic decision-making points in determining content priorities are: (1) current functioning level of the child; (2) any specific physical limitations; (3) age of the child; and (4) functional behavioral goals. For any given child any of the first three areas may take priority; however the concept of a functional goal must always be the major priority for planning.

Current Functioning Level

Before any meaningful program can be developed an accurate statement of the current functioning level of the child in each content area must be made. This is interpreted as the highest level of the skills the student has in each level. For example, the content area of communication can be easily divided into two major subcomponents——expressive and receptive language. In each of these two subcomponents there is a fairly agreed-upon sequence of skills. The assessment information in this area should reflect exactly where in the sequence the child is performing. Hence, the priority area for instruction should be at the next level. When programming is planned at a lower level valuable instructional time will be lost. If programming occurs at too high a level there will be little, if any, success as well as a high degree of frustration on the part of both student and teacher. A caution should be noted at this point: Regardless of the appropriateness of the initial assessment data, mistakes will be made. With the careful use of ongoing assessment procedures, teachers are able to quickly detect any pinpoints that are too high or too low for a given child. In essence, daily instructional data should probably take precedence over initial assessment data in determining level of instruction, but if the daily data indicates a lower level of functioning than did the initial assessment, a careful explanation of the initial assessment data is called for. In this case the teacher will have to consult with the individuals who collected the initial assessment information and try to determine the cause of the discrepancy.

Physical Limitations

There are very obvious physical limitations that will necessitate alterations in priorities. For example, students who have no use of their fingers (and there is little or no hope for an increase in these functions) should not be programmed for pincer grasp activities. In this case alternative skills need to be taught. Or, completely deaf children should not be expected to acquire basic auditory skills. These obvious cases of physical limitations will certainly alter the instructional priorities. However, specific functions (e.g., motor manipulation, receptive language) still must remain as instructional priorities; only the specific skill descriptions will change. A very special caution is needed here: many times these obvious physical limitations are poorly documented. Many cerebral palsy children and partially sighted children have been poorly programmed because teachers assumed they could never use their fingers or see. Any case of physical limitations must be precisely documented before priorities are changed.

Age of the Student

The age of the student plays a specific role in determining priorities. Clearly, programming for infants will focus on basic developmental milestones (basic reflexes, etc.). An older individual——16- or 17-years-old—— requires somewhat different programming, if for no other reason than there is a much shorter period of available instructional time left. There are, however, some basic skills that are critical, regardless of the age of the child. These basic skills are: basic expressive and receptive communication (respond to name, indicate yes/no), basic self-help skills (self-feeding, -toileting, -dressing, -grooming), and mobility (movement through the environment). In reality, these are fairly high level skills for many profoundly handicapped individuals and expectations need to be based on

common sense. Especially with severely handicapped adolescents, we must look very carefully at the types of skills we are trying to teach. A rule of thumb should be, "Are pinpoints teaching to immediate functional behaviors for the individual?" As the age of the student increases, this question becomes more pressing.

Functionality of Skills

The ultimate criteria for programming must be: "Will this skill provide the individual with a functional behavior that will directly enhance his/her ability to live independently?" This priority should direct all goal setting activities. Unfortunately many educational objectives are established simply because these objectives are "always used." In essence our educational programming is often superstitious behavior. There is a long list of critical behaviors for all future development (head control, pincer grasp, discrimination skills, etc.), but there is also a list of behaviors which may or may not be functional for later development (bead stringing, puzzles, etc.) which are often given as critical educational objectives. Each skill that is taught should either be a functional behavior in and of itself or should be a building-block skill (a skill which is part of a functional behavior).

There are obvious instances when alterations need to be made, as in the case of physical limitations, when extra enrichment activities such as swimming can be included and when a specific task can be used to teach a certain skill, e.g., bead stringing to teach pincer grasp. However, each goal and objective must be determined in light of its relevancy to functional behavior.

Determining How to Meet the Goals

Upon the determination of the yearly goals the committee must devise procedures that will facilitate their accomplishment. This task includes the setting of some short term objectives for each yearly goal; the determination of any needed special services, their duration, and who will perform these services; a means for evaluating each yearly goal; the establishment of a meaningful physical education program; and plans for integrating the handicapped child with non-handicapped peers. Finally, the committee must agree upon a specific placement for the child and a brief justification for it, establish timelines for all future committee meetings, and sign the IEP.

Establishing Short Term Objectives

For each yearly goal the committee needs to determine several short term objectives which will lead to the final desired behavior. Although the number of short term objectives will undoubtedly vary from committee to committee and child to child, a general rule of thumb should be at least four objectives for each formal evaluation period. Hence, if the IEP is to be evaluated twice a year there should be eight short term objectives per yearly goal.

These objectives should be written in terms of student performance. Thus, each objective should include a behavioral statement as to what the student will do, under specific conditions and to what criteria. For example, "On teacher command, Anne will touch a hair brush (no distractors) on four or five commands, for two consecutive days."

These short term objectives are to aid the teacher in developing a functional instructional sequence for each yearly goal. However, the teacher must have the flexibility to alter the sequence based on daily classroom data. Most importantly, however, the objectives should lead to the accomplishment of the yearly goal.

Listing Special Needs

After short term objectives have been established for each yearly goal the committee must list all special services that might be required to achieve these objectives. For example, if the yearly goal is to develop the pincer grasp (thumb and forefinger) the committee might decide that the short term objectives are:

1. Rebecca will hold a rocker stacker ring in her hand for at least one minute;
2. Rebecca will rake an object to her when the object is placed within 18 inches of her, four or five times;

3. Rebecca will pick up three one inch cubes, using a palmar grasp, in one minute;
4. Rebecca will pick up six one inch cubes, using a pincer grasp, in one minute.

For these objectives the committee may decide that an occupational therapist should evaluate Rebecca's progress on a weekly basis and prescribe exercises for Rebecca's hands based on this evaluation. In this instance, the special service of occupational therapy needs to be noted, along with the name of the therapist, when these services will begin and end, and how these services will be evaluated (in this case the evaluation will correspond to the child's objective).

The committee must note each type of special service which may be required in order to achieve the yearly goals (medical services, therapy, speech and language, prosthetic, etc.), who will perform these services, for what period of time (beginning and ending date) and how each service will be evaluated.

Physical Education Plan

The committee must recommend an appropriate physical education plan for each student. In most cases of programs for severely/profoundly handicapped students, traditional physical or occupational therapy stands in lieu of this requirement. However, especially for adolescent students, specific training in games and other types of physical leisure time activities certainly are desirable goals. The yearly goals of the child will greatly determine the type of physical education plan that is most appropriate for each student.

Statement on Integration

The committee needs to prepare a joint statement specifying all instances when the student will interact with non-handicapped peers. Obviously, this statement will depend on the skill levels of the child and the opportunities that are available in any given school district. Activities such a lunc recess and other planned activities should be included here. However, the committee should be very careful to only list those activities in which planned, meaningful interaction will take place.

Placement Justification

Upon the completion of the entire IEP the committee must prepare a brief statement of justification for the placement. This statement simply needs to indicate the placement why it is deemed most appropriate for the child, and that the entire committee agrees with this placement.

Time Frame

The time frame under which IEP's must be generated are fairly clear-cut in terms of severely/profoundly handicapped students. Obviously these students will be identified early in their school life and hence the IEP for each student needs to be completed within 30 days of the beginning of the school year. At a minimum, the IEP needs to be evaluated and reformulated annually. In many cases the IEP will probably require more frequent evaluation.

Certainly committees that have good working relationships will be in frequent communication and informal evaluations will occur periodically throughout the school year. The last duty of the committee is to sign the IEP document, indicating approval by each member.

Instructional Plans

An IEP, by itself, is insufficient. Just as assessment information must be formulated into an IEP, the information from the IEP must be developed into individual instructional plans for each child. Although the format of these instructional plans will vary across districts, the basic components of these plans are stable.

An instructional sequence must be developed for the skill that is to be taught From this instructional sequence, the immediate child performance objective is determined. Procedures are then derived which will facilitate the desired child response (materials, teacher activities). Specific consequences are selected for each type of possible child response--correct, incorrect, no response. Finally, a procedure for measuring the effects of the instructional program is devised.

Instructional Sequence

An instructional sequence must be developed for each objective stated in the IEP. The instructional sequence is developed by one of two basic techniques; task analysis or use of developmental sequences.

Task analysis.

Task analysis may be used to determine an instructional sequence. Using this procedure, a competent individual is observed doing the task and observers note the sequence of the various steps performed to complete the task. For example, for buttoning, the sequence might be: pinch button, pinch button hole, put button in button hole, push button through hole, pinch cloth near button hole, pull button and cloth, release fingers. Almost any motor task can thus be broken down into very small sequential steps which lead from the beginning to the end of the desired skill.

Developmental sequences.

For some behaviors, which develop differently than they are performed, developmental sequences need to be used. For example, rolling over is topographically different when sequenced through the task analysis of a competent "roller-over" as compared to how infants learn to roll over. Competent adults roll over in many different ways, e.g., by leading with the hips and then having the knee and arms follow. Infants, however, almost always begin to learn to roll over by leading with their eyes, then head, arms, shoulders, hips, and legs. Thus, for some skills, we need to consult with developmental guidelines in order to determine the most appropriate instructional sequence. However, regardless of the technique used to formulate the instructional objectives, these objectives must be organized into an efficient instructional sequence, which may be different than the original sequence.

There are three basic techniques which can be used to resequence specific skills into instructional sequences: forward chaining sequences, backward chaining sequences, and middle chaining sequences. The first two, forward and backward chaining sequences, are very common. In forward chaining, the first skill is taught first, the second skill second, and so on until the terminal skill is achieved. In backward chaining, the last skill of the sequence is taught first, the second to last skill second, and so on until the student can perform the entire skill independently. Chaining from the middle of the sequence out to beginning and end is less common but often very effective. For example, a developed sequence for self-feeding with a spoon could be: grasp spoon, scoop, bring to mouth, put in mouth, remove food from spoon, remove spoon from mouth, chew and swallow food, return spoon to plate, and repeat cycle. The instructional sequence might be altered by taping the spoon to the child's hand and beginning the instructional sequence with, put spoon in mouth, and working both backward and forward in the sequence.

Although instructional sequences are determined by task analysis or developmental sequences, the teachers must take the time to explore the best possible sequence for teaching. There are no fixed rules as to which type of sequence works best; only by carefully trying different procedures can a teacher determine which works best with any given child.

Child Performance Objective

After the instructional sequence has been developed, the immediate instructional object must be written in clear behavioral terms. Care and consideration at this point will facilitate instruction and the collection of ongoing assessment data. Basically an instructional objective should state the child's desired behavior in observable and measurable terms and should include a specific criterion for success.

Teaching Procedures

Upon the completion of the immediate instructional objective the teacher's next task is to review the IEP in order to determine if any special considerations need to be noted in developing the instructional procedures to be used with the child. The teacher must select the materials and procedures that will be used to teach the objective. Obviously both the materials and procedures will

vary greatly depending on the specific characteristics of each child. The materials need to be related to the objective being taught, special learning characteristics of the child, and of course, safety considerations. Procedures such as modeling, cueing, or prompting need to be selected depending on the child and the objective. Careful considerations at this time will greatly determine the success of the plan.

Consequences

The next task for the teacher is to determine consequences for all possible child responses to the instructional procedures. Basically there are only four possible child responses: correct, incorrect, no response, or acting-out. Hopefully a specific program will be developed for any acting-out behavior that can be used throughout the day. The teacher must decide how to reinforce the child for correct responses, how to respond to error responses, and what to do if the child makes no response. The IEP should provide some clues as to possible reinforcers. Response to error will depend on the child and the instructional objective but certainly might include correct model, physical shaping, or prompting. No response consequences might include repeat of instructions, prompts, or reinforcing sampling (physical prompting and giving the reinforcer). In any regard, the teacher must plan for all these possible contingencies.

Evaluation

The final planning task for the teacher is to develop an effective and easy to manage data system to provide for ongoing assessment. The system must supply information to answer the question, "Is the instructional plan working?" Although these procedures may vary greatly, they must include an actual measure of correct child performance in relationship to the number of opportunities and/or time. Ideally, data will be collected daily on each child's program. Probes, partial samples or even samples taken two or three times a week might be required due to circumstances in any given classroom. Somehow, the teacher must make data decisions about the child's program, either to change the program, or continue with it, or to celebrate success and move on to a new objective. With this system developed, the teacher is ready to implement the instructional plan and make good instructional decisions throughout the school day.

Conclusion

The IEP component, along with the provision of full educational opportunities for all, is probably the most revolutionary aspect of P.L. 94-142. In fact, the IEP is the cornerstone by which appropriate education is defined for each child. As a result, it is not surprising that the concept of IEP's has caused the most concern among professionals in the field.

Although, in reality, the separate components of the IEP have always been included in any good educational plan for handicapped children, any time educational practices are mandated by law, professionals tend to view the new requirement as a hardship. The committee requirement in the development of IEP's has also added to the anxiety of the field. Rather than viewing the IEP as another hoop to jump through we encourage you to accept this opportunity to improve the quality of education for handicapped children. As with any new convention, one can find many problems with the IEP concept; but on the other hand, one can also find that the IEP will provide many solutions to problems associated with the education of severely/profoundly handicapped students. If we adopt the solution viewpoint, IEP's will become one of the most useful educational practices in special education.

INDIVIDUALIZED EDUCATIONAL PROGRAM

Child's Name:_____ School: _____

Date of Program Entry:_____ Age: _____

Placement Recommendation and Justification:_____

_____

Date for Re-evaluation:_____

Committee Members Signatures: _____

_____

Summary of Present Levels of Performance: _____

Yearly Goals: _____

Regularly Planned Activities with Non-handicapped Children: _____

Committee Recommendations for Specific Educational Services (Include physical education plan, special media or materials): _____

Medical Concerns (Drugs, seizures, etc.): _____

Proven Reinforcers: _____

Stimulus Control Information: _____

Precautions: _____

Physical Considerations: _____

Date of Committee Meetings _____

INDIVIDUALIZED EDUCATIONAL PROGRAM

Child's Name: Rebecca School: Viewlands

Date of Program Entry: September, 1975 Age: 9-1

Placement Recommendation and Justification Intermediate MR:

This program provides the least restrictive educational opportunity for Rebecca currently available in our school district.

Date for Re-evaluation: February 1978, May 1978

Summary of Present Levels of Performance:

GROSS MOTOR: Rebecca can jump, run, climb, and ride a trike.
SELF-HELP: She can dress and undress, toilet, and feed herself.
COMMUNICATION: She says her own name, cookie, juice, and Momma and uses these appropriately.
SOCIAL: Rebecca plays in isolation but seeks out adults.
PRE-ACADEMIC: She can match simple objects.

Yearly Goals:

1. Rebecca will throw a ball (6" diameter) a distance of 10' to a peer.
2. Rebecca will follow the rules at lunchtime without 1:1 teacher supervision.
3. Rebecca will say hello to the teacher each morning.
4. Rebecca will name three objects (spoon, cup, hairbrush).
5. Rebecca will engage in parallel play with 1 or 2 peers 25% of free time.
6. Rebecca will select three shapes (circle, square, triangle).

Regularly Planned Activities with Non-handicapped Children:

Rebecca will have lunch with non-handicapped peers. The lunchroom aide will encourage interaction between Rebecca and the other children.

Committee Recommendations for Specific Special Educational Services (Include physial education plan, special media or materials):

1. CDS will help teacher to establish the "hello" program, other spontaneous speech, and the naming program.
2. School nurse will consult with the home concerning meal time manners.
3. P.E. teacher will consult with the teacher to develop a program for ball throwing and bicycle riding.

Medical Concerns (Drugs, seizures, etc.):

Medication for seizures (no seizures in past two years) administered by teacher at lunch (1 pill 10 mg. dilantin). No restrictions on physical activity.

Proven Reinforcers:

Rebecca consistently works for all types of sugar-coated cereal and orange juice. Social praise is

becoming reinforcing but acquisition tasks should be pursued with edibles. Music, especially country, has shown promise during gross motor activities.

Stimulus Control Information:

Rebecca responds to "look at me," "do this," and "let's work." If she does not respond, move back to "Look at me," with cereal or juice visible and reinforce appropriate responses.

Precautions:

1. In the past, Rebecca has been known to have violent temper tantrums. The most effective technique to handle these is to remove Rebecca from the room and ignore her. She has not run, destroyed property nor harmed herself once removed from the class.
2. Seizures have been controlled for the past two years. However, she has had grand mal seizures in the past. If she has a seizure, use standard procedures and inform the parents. Her physician is monitoring her medications, and the exact time of the seizure as well as the duration should be noted.

Physical Assessment:

Rebecca has no major physical problems. Her left hand, however, is somewhat non-functional, so all fine motor activities should be directed toward her right hand. Physical therapy has been discontinued for her left hand under advice from her physician.

Dates of Committee Meetings:

September 5, 1977

Child's Name: Rebecca

Long Term Goal Statement: Rebecca will throw a 6" diameter ball to a peer at a distance of 10'.

Short Term Objectives (Include Evaluation Criteria)	Specific Educational and/or Support Services	Persons Responsible for Implementation	Beginning End Date	Review Date
a) Rebecca will throw a ball, with teacher assistance on 5 of 5 trails, 2 consecutive days.	P.E. Teacher/Consult	Teacher/Aid	9/77 10/1/77 change criteria: 5 of 5 2 consecutive days	10/1/77
b) Rebecca will throw ball, without assistance, toward teacher on 5 of 5 trails, 2 consecutive days	P.E. Teacher	Teacher/Aid	10/1/77 11/1/77	11/1/77
c) Rebecca will throw ball to teacher and another child for a distance of 2' on 5 of 5 trials, 2 consecutive days	P.E. Teacher	Teacher/Aid	11/1/77 12/15/77	12/15/77
d) Rebecca will throw ball to teacher and child for a distance of 5', on 5 of 5 trials, 2 consecutive days	P.E. Teacher	Teacher/Aid	1/4/78 3/1/78	3/1/78
e) Rebecca will throw ball to child a distance of 10', 5 of 5 trials, 2 consecutive days	P.E. Teacher	Teacher/Aid	3/5/78 5/15/78	5/15/78

Child's Name: Rebecca

Long Term Goal Statement: Rebecca will follow the rules at lunchtime without 1:1 teacher supervision

(Rules are: No disturbing others, stay in lunchroom)

Short Term Objectives (Include Evaluation Criteria)	Specific Educational and/or Support Services	Persons Responsible for Implementation	Beginning End Date	Review Date
a) Rebecca will stay in lunchroom with teacher attention		Teacher	9/77 10/77	10/1/77
b) Rebecca will stay in lunchroom without teacher attention		Teacher	10/7/77 12/1/77	12/1/77
c) Rebecca will not disturb other children, with teacher attention		Teacher	1/4/78 3/1/78	3/1/78
d) Rebecca will not disturb other children, without teacher attention		Teacher	3/1/78 5/30/78	5/30/78

Child's Name: Rebecca

Long Term Goal Statement: Rebecca will say hello to the teacher each morning.

Short Term Objectives (Include Evaluation Criteria)	Specific Educational and/or Support Services	Persons Responsible for Implementation	Beginning End Date	Review Date
a) Rebecca will imitate teacher saying hello 5 of 5 trials	CDS Consult	Teacher	9/77 10/1/77	10/1/77
b) Rebecca will imitate teacher saying hello in morning on 3 consecutive days	CDS Consult	Teacher	10/1/77 1/1/77	11/1/77
c) Rebecca will imitate content with teacher and imitate hello on 3 consecutive mornings	CDS Consult	Teacher	11/1/77 1/15/78	1/15/78
d) Rebecca will imitate content and say hello to teacher	CDS Consult	Teacher	1/15/78 4/15/78	4/15/78

Child's Name: Rebecca

Long Term Goal Statement: Rebecca will name three objects (Spoon, cup, hairbrush)

Short Term Objectives (Include Evaluation Criteria)	Specific Educational and/or Support Services	Persons Responsible for Implementation	Beginning End Date	Review Date
a) Rebecca will imitate teacher and say spoon, no distractions, 5 of 5 trials on 2 consecutive days (repeat for cup and hairbrush)	CDS Consult	Teacher	9/77 11/15/77	11/15/77
b) Rebecca will say spoon (cup, hairbrush) upon presentations, no distractors, 5 of 5 trials, on 2 consecutive days	CDS Consult	Teacher	11/15/77 2/30/78	2/30/78
c) Rebecca will say spoon (cup, hairbrush) with one distractor 5 of 5 trials, 2 consecutive days	CDS Consult	Teacher	2/30/78 4/15/78	4/15/78
d) Rebecca will name cup, spoon, and hairbrush with two distractors, 5 of 5 trials on 2 consecutive days	CDS Consult	Teacher	4/15/78 5/30/78	5/30/78

Child's Name: Rebecca

Long Term Goal Statement: Rebecca will select three shapes (circle, square, triangle)

Short Term Objectives (Include Evaluation Criteria)	Specific Educational and/or Support Services	Persons Responsible for Implementation	Beginning End Date	Review Date
a) Rebecca will point to square (triangle, circle) no distractors, 5 of 5 trials on 2 consecutive days		Teacher	9/77 11/15/77	11/15/77
b) Rebecca will point to square (triangle, circle) one distractor, 5 of 5 trials on 2 consecutive days		Teacher	11/15/77 1/30/78	1/30/78
c) Rebecca will point to square, triangle, and circle, two distractors, 5 of 5 trials on 2 consecutive days		Teacher	1/30/78 3/15/78	3/15/78

Child's Name: Rebecca

Long Term Goal Statements: Rebecca will engage in parallel play with 1 or 2 other children 25% of time during free play activity

Short Term Objectives (Include Evaluation Criteria)	Specific Educational and/or Support Services	Persons Responsible	Beginning End Date	Review Date
a) Child will engage in play activity with teacher assistance		Classroom Staff	9/10/77 — 10/10/77 change criteria: compliant 4 successive days	10/10/77
b) Child will engage in play activity when verbally cued by teacher			10/10/77 — 11/10/77 CC = 75% for 4 successive days	11/10/77
c) Child will play with teacher beside another child			1/10/78 CC = 75% for 4 successive days	
			1/10/78	
d) Child will play with another child in vicinity of teacher			1/30/78	
e) Child will play 3 feet from other child without teacher present			2/1/78 — 2/15/78	2/28/78
f) Child will play beside other child			2/16/78	

INDIVIDUAL PLAN SHEET

PUPIL _____ GOAL _____ OBJECTIVE _____

CHILD PERFORMANCE OBJECTIVE	DATE	TEACHING PROCEDURES	CONSEQUENCES			EVALUATION
			CORRECT	ERROR	NO RESPONSE	

INSTRUCTIONAL SEQUENCE

GOAL _____ OBJECTIVE _____

INDIVIDUAL PLAN SHEET

PUPIL Rebecca

GOAL Pre-academic

OBJECTIVE Selecting shapes square, circle, triangle

Rebecca will touch square on teacher model, no distractors, 5 of 5 trials, two consecutive days.
Rebecca will touch square on teacher command, no distractors, 5 of 5 trials, two consecutive days.
Rebecca will touch circle on teacher model, no distractors, 5 of 5 trials, two consecutive days.
Rebecca will touch circle on teacher command, no distractors, 5 of 5 trials, two consecutive days.
Rebecca will touch triangle on teacher model, no distractors, 5 of 5 trials, two consecutive days.
Rebecca will touch triangle on command, no distractors, 5 of 5 trials, two consecutive days.
Rebecca will touch square on teacher command, circle as distractor, 5 of 5 trials, two consecutive days.
Rebecca will touch circle on teacher command, square as distractor, 5 of 5 trials, two consecutive days.
Rebecca will touch triangle on teacher command, circle as distractor, 5 of 5 trials two consecutive days.
Rebecca will touch square on teacher command, circle and triangle as distractors, 5 of 5 trials, 2 consecutive days.
Rebecca will touch circle on teacher command, square and triangle as distractors, 5 of 5 trials, 2 consecutive days.
Rebecca will touch triangle on teacher command, square and circle as distractors. 5 of 5 trials, 2 consecutive days.

Instructional Program: Criteria

Possible Points			Points Earned
5	1.	Introduction	_____
	2.	Method	
5		a. behavior description of student (outline present performance)	_____
10		b. behavioral objectives (short & long term), task analysis, and prerequisite skills	_____
15		c. teaching methods (correction, reinforcement procedures, materials, etc.)	_____
5		d. data collection procedures	_____
5	3.	Results of program and discussion	_____
5	4.	Recommendations (suggestions for maintenance and generalization)	_____

Description of Components

1. Introduction - There should be a brief overview of why the program is important to the student and how it fits into the student's long-range educational plan.
2. Method
   a. The behavior description of the student should include CA, functioning level, and sensory or physical impairments; it should also include the results of assessment tools which were used.
   b. Behavioral objectives should include a statement of conditions of learning behavioral description of skills, and criteria for performance. There should be a minimum of three task analyses and prerequisite skills for each task analysis. Task analyses should be broken down into smallest possible components and follow a logical hierarchy.
   c. Teaching methods must describe how the teacher taught the skill exactly. Instructions modeling, physical assistance, use of peers, type and amount of reinforcement, correction procedures, color-coding, easy-to-hard sequencing, amount of practice, etc. are the types of procedures which may be described.
   d. Data collection procedures need to be described. A sample data collection sheet should be provided along with a statement of frequency with which data are collected.
3. Results and Discussion - The results of the instructional program should be briefly described along with graph presentation. The discussion allows for an opinion on why the program was successful, how it could be improved, etc.
4. Recommendations - As a result of this program, the participant should make concrete suggestions to the school and parents. In this section, suggestions may be made about how the child's overall program may be improved. In addition, suggestions for maintenance and generalization should be included.

AN INSTRUCTIONAL PROGRAM FOR TEACHING SEVERELY AND PROFOUNDLY HANDICAPPED PUPILS

ABSTRACT: This paper presents and discusses the instructional procedures and task analyses for ascending and descending climbing bars and a slide. The program was utilized with a six year old girl classified as severely/profoundly handicapped.

Introduction

The extent to which one possesses gross motor competencies will markedly affect that person's ability to independently explore the environment and receive varied gratification from within that environment. Gross motor skills can be broadly conceived of as aiding one in achieving mobility in two directions: (1) horizontal plane of movement and (2) vertical plane of movement. Ideally, severely and profoundly handicapped students will receive training geared, to the extent it is feasible, in both horizontal and vertical planes of gross motor development.

This paper deals with the development of gross motor skills in the vertical plane of movement. Specifically, skills of ascending and descending climbing bars and ascending and descending a slide. The subject is Mindy B., a six and a half year old girl who is assigned to the Developmental Unit at Ruby Van Meter School in Des Moines, Iowa. The program was initiated during the summer school session of 1977 because it fell into logical sequence with the student's previous gross motor training and the climbing bars and slide are part of the recreational materials available in the open space area at Van Meter.

On a broader perspective climbing skills have importance for Mindy in terms of future recreational and vocational pursuits. Recreationally, climbing skills are required in play activities such as utilization of "monkey bars", jungle gyms and slides which are commonly found in community parks. Additionally, these activities provide opportunities for parallel play and cooperative play as she grows in social skills. Vocationally climbing skills are essential in activities utilizing step ladder, retreiving items located out of arm reach in high places and moving up and down stairs.

Classroom Description

In the summer school program Mindy is one of four children ranging from the age of 6 ½ to 8 years of age. There are four teachers in this classroom, one head teacher, Barb Kelly, and three teachers participating in the practicum as an aspect of the workshop. All of the pupils are assigned to the developmental unit and are considered severely and profoundly handicapped. All of the teachers are certified as teachers of the mentally retarded. Of the four pupils 3 are females and one is a male.

The summer school curriculum consists of seven components:

I. Social and Play Skills
II. Following Instructions
III. Gross Motor Skills
IV. Communication Skills
V. Fine Motor Skills
VI. Self Help Skills
VII. Recess

The classroom is approximately ninety feet by ninety feet with an entrance-exit to the outside (playground) and entrance-exit to the open space area which connects to the hallway and main lobby area. Equipment includes: *large motor equipment* such as scooters, rockers, climbing bar, and carpeted board with casters; *toys such as* car, balls, building blocks, wind-up musical radios; and *fine motor materials* such as buttons and colored chips for sorting, paper and crayons, wooden blocks and plastic rings for stacking.

Foods to be used as primary reinforcers were provided. These edibles include marshmallows, chocolate, fruit punch, crackers and fruit loops.

The classroom is equippedwith an electric clock with second sweep hand and a storage cabinet behind which was provided a time out space.

Description of Student

Mindy is the youngest of two children in a family with both natural parents present. She was born in November 1970 and is now 6 years 8 months of age. Mindy was markedly developmentally delayed, for example, she was unable to walk until 18 months, made no sounds until two years and currently has no functional speech.

Mindy began school at Van Meter in Des Moines during the 1976-77 school year and is currently enrolled in summer school program at Van Meter.

She has received various evaluations. While there have been several efforts to perform psychological assessments indicated in Mindy's culmulative folder only one was indicated as not invalid. At the age 3-11 Mindy was administered the Bayley Scales and earned a mental age of 19 months and motor age of 20 months. Mindy's diagnosis was indicated to be "mental and motor retardation" according to the Child Study Center in Des Moines at the age of 3 years. Vision and hearing tests have not been conclusive due to her irratic method of responding and not responding. For all practical purposes Mindy appears to hear and see because she responds to directions and can locate objects such as buttons and color chips by sight.

In the summer school program Mindy's current function is as follows:

I. *Appropriate Play* - She is stacking 2 objects and beginning to stack three objects.

II. *Following Directions* - She can do one step directions. Her rate of compliance is approximately 50% on the first request. Mindy's range of responding to directions following requests ranges from 0 to 100% on various days.

III. *Gross Motor* - Mindy has learned to climb up, over and down the climbing bars and is acquiring experience in climbing up and descending a slide.

IV. *Communication* - Mindy's communication program consists of work on signs "hug", "food" and "drink". She has not demonstrated the ability to respond to these words without prompts on a consistent basis.

V. *Fine Motor* - The major task related to fine motor is sorting red and blue chips which she is doing with 75% accuracy.

VI. *Self Help* - She is working on buttoning and hand washing. Mindy can button if the button is inserted into the hole and can wash hands by rubbing them together if soap is on the hands.

VII. *Recess* - Mindy's play is isolated and typically involves sitting alone and pulling grass by hand.

Mindy enjoys large toys such as the rocker and scooter as well as edibles such as fruit juice, marshmallows and crackers. These have been used successfully as reinforcers. Mindy enjoys recess period as well.

Mindy also can become frustrated and typically shrieks, cries or runs to another part of the room. She has been put into the time out of reinforcement room 22 times in 9 days for behavior just described. The range of times in time out was 0-5 with an average of 2.5 per day. Additionally Mindy can tease or taunt an adult. This takes the form of non-compliance then laughing then running which results in being chased. It is well performed on her part and calculated to generate this outcome.

Long and Short Range Expectations

Goal:

Mindy will be able to successfully and independently use gross motor skills for ascending and descending tasks for recreational and vocational purposes. Recreational use may include play equipment such as climbing bars, slides and jungle gyms. Vocational situtation may involve use of stairs, ladders and climbing on a chair.

Short Range Objective: (climbing bars)

By June 6, 1977 Mindy will climb up, over and down the climbing bars (which have four rungs above ground level on both sides and a top rung in the center) without slipping on any of the steps in three out of four attempts on two consecutive days.

Short Range Objective: (slide)

By June 6, 1977 Mindy will climb up and slide down the slide unaided by directional prompts but with verbal encouragement. This behavior will be performed without slipping on the stairs and descending the length on the metal slide. This behavior will be demonstrated in three out of four attempts on two consecutive days.

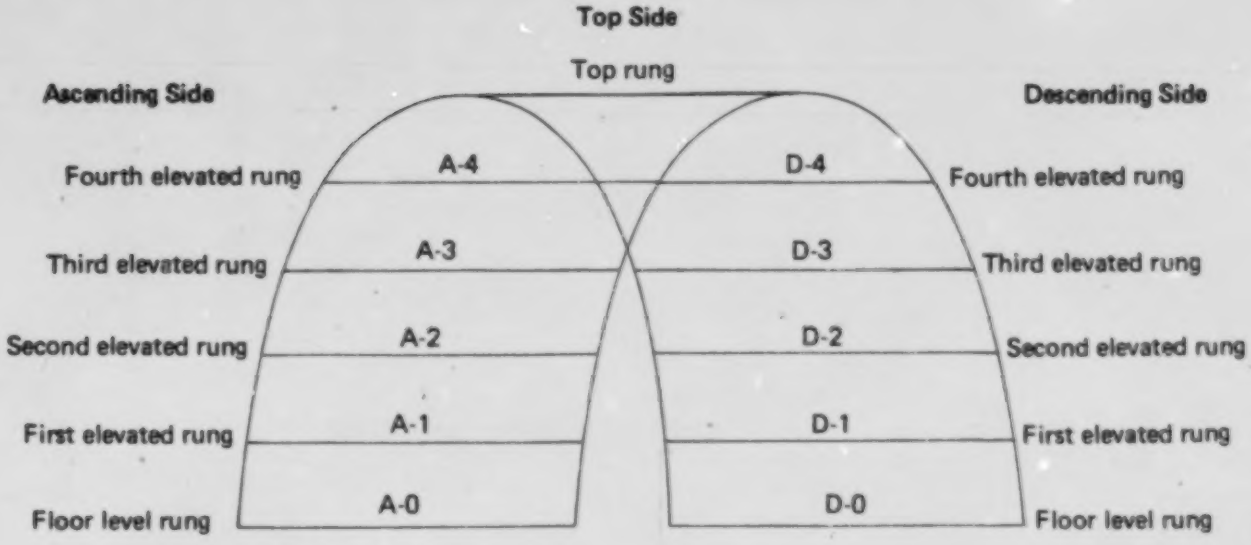
Prerequisite Skills for Climbing Bar Program

It is assumed, to be successful on the Climbing Bar Program, that the pupil possesses the following skills: skills:

1. Can grasp bar with hands.
2. Can lift and lower own legs unaided 12-14 inches, vertically.
3. Can balance on one foot with support of both hands.
4. Can push up and lower own body weight with support of both hands and one foot.
5. Can walk.

Structural References in Task Analysis of Climbing Bar

As an aid to the reader of the task analysis the rungs of the climbing bar will be numbered from the floor level up to the top and referred to according to whether they are on the front or ascending side (A) on the back or descending side (D). Additionally "climbing bar" will be referred to with the abbreviations CB.



Task Analysis of Climbing Bars

1. Face climbing bars (CB).
2. Walk to CB.
3. Stop in front of CB.
4. Reach out with both hands toward CB at or above shoulder level.
5. Grasp CB rung at or above shoulder level.
6. Lean upper portion of torso foward and partially support body weight with arms.
7. Shift balance of weight to right foot.
8. Lift left leg up, ± to 4 inches above first elevated rung, A-1.
9. Lower left foot onto A-1.
10. Pull up body weight with arms.
11. Lift right leg up, ± - 4 inches above A-1.
12. Lower right foot onto A-1.
13. Balance weight between left and right feet on A-1 with partial support from arms and hands.
14. Lift left leg up, ± - 4 inches, above second elevated rung, A-2.
15. Shift balance of weight to right foot.

16. Lower left foot onto A-2.
17. Pull up body weight with arms.
18. Lift right leg up, ± - 4 inches, above A-2.
19. Lower right foot onto A-2.
20. Balance weight between left and right feet on A-2 with partial support from arms and hands.
21. Release hand from bar and reach top rung with dominant hand.
22. Grasp top rung with dominant hand.
23. Release other hand from bar and reach top rung.
24. Grasp top rung with other hand.
25. Lift leg up, ± - 4 inches, above A-3.
26. Shift balance of weight to right foot.
27. Lower left foot onto A-3.
28. Pull up body weight to right foot.
29. Lift right leg, ± - 4 inches, above A-3.
30. Lower right foot onto A-3.
31. Balance weight between left and right feet on A-3 with partial support from arms and hands.
32. Lift left leg up past A-4.
33. Lift left leg to top rung of the CB.
34. Balance on right foot.
35. Move left leg over top rung of the CB.
36. Shift center of balance toward left leg, so center of gravity is over top rung.
37. Lower left leg onto the third elevated rung of the back side of the CB, D-3.
38. Release grasp of left hand from top rung.
39. Move left hand to the opposite side of top rung so that the thumb of left hand is facing the front side of the CB and the heel of the hand is toward the backside or descending side of CB.
40. Grasp top rung with the left hand.
41. Pivot left foot so the heel faces the back side or descending side of the CB and toes are facing the front or ascending side of CB. This foot is on D-3.
42. Lower left shoulder and shift body weight toward left hand.
43. Move right leg up to top rung.
44. Turn right hand so that the thumb faces the ascending side and heel of hand is toward the descending side of top rung.
45. Lower right leg to D-3 with toes pointing toward ascending side.
46. Assume upright position with weight supported by two hands on the top rung and both feet on D-3.
47. Raise left foot up from D-3.
48. Lower left leg to position above D-2.
49. Shift support of weight to right foot and both hands.
50. Place left foot on D-2.

51. Support weight with both hands and left foot.
52. Raise right foot up from D-3.
53. Lower right leg to position above D-2.
54. Place right foot on D-2.
55. Raise left foot up from D-2.
56. Lower left leg to position above D-1.
57. Shift support of weight to right foot and both hands.
58. Place left foot on D-1.
59. Support weight with both hands and left foot.
60. Raise right foot up from D-2.
61. Lower right leg to position above D-1.
62. Place right foot on D-1.
63. Release hand from top bar and lower dominant hand to D-4.
64. Grasp D-4 with dominant hand.
65. Release other hand from top bar and lower to D-4.
66. Grasp D-4 with other hand.
67. Raise left foot up from D-2.
68. Lower left leg to position above floor.
69. Shift support of weight to right foot and both hands.
70. Place left foot on floor.
71. Support weight with both hands and left foot.
72. Raise right foot up from D-2.
73. Lower right leg to position above floor.
74. Place right foot on floor.
75. Release grasp of CB with left hand.
76. Release grasp of CB with right hand.
77. Stand erect on both feet.

Teaching Procedures for Climbing Bars

1. Given instructions "Mindy, come. Let's climb," *S (Subject)* will walk to the climbing bars (CB). Wait 5 seconds.

   A. If *S* does not comply

      1) A gesture in the form of the sign, in the SEE system, ("come") is presented in a manner which will insure *S* can see the sign and repeat the instructions. ("Mindy, come. Let's climb.")

   If *S* does not comply

      2) An auditory prompt in the form of tapping on the appropriate rung of the CB is presented with the instructions repeated. ("Mindy, come. Let's climb.")

   If *S* does not comply

3) Guide *S* by hand as a full physical prompt in completing the task and say the instructions again. ("Mindy, come. Let's climb.")

B. When *S* complies with instruction, provide consequences as described

1) Types of reinforcement

a. *Verbal reinforcement* in the form of statements include "Nice work." "Good girl." "That right," "Yes. Mindy," "Good," "Good Mindy" and other words of praise.

b. *Preferential activity reinforcement* could be selected from a reinforcement menu. *S* enjoys rocker, riding the horse and the rocking board.

2) Frequency of verbal reinforcement and schedule for thinning.

Task performed successfully	Consecutive trials	Reinforcement schedule
0-1 of 2	(0-50%)	100%, every correct response
3 of 4	(75%)	50%, every other correct response
4 of 5	(80%)	33%, every third correct response
more than 4 of 5	(80%)	intermittent schedule, less than 20% of correct response

3) Frequency of preferential activity reinforcement.

At the conclusion of each successful attempt to climb *S* is provided with the opportunity to play with a toy of her preference for 30 or 40 seconds. Successful attempt" means correctly performing the task in the hierarchy which is at 50% or 100% reinforcement rate. "Unsuccessful attempt" means the trial ended at a task which is on an intermittent schedule, or 33% schedule.

If the attempt was unsuccessful *S* is guided and instructed to begin again from Step I.

2. Given instruction "Mindy, hands on bars" *S* will grasp rung as described in steps 4 and 5 of TA. Wait 5 seconds for compliance.

   A. If *S* does not comply, follow procedures indicated in 1.A., teaching procedures.

   B. When *S* complies with instruction, provide consequences as described in 1.B. of the teaching procedures.

3. Given instruction "Mindy, climb up," *S* will ascend the climbing bars as indicated in steps 6 through 20 of TA. Wait 5 seconds for compliance.

   A. If *S* does not comply, follow procedures indicated in 1.A., this section.

   B. When *S* complies with instructions, provide conseqeunces as described in 1.B. of the teaching procedures.

4. Given instruction "Mindy, move hand up," *S* will grasp the top rung of CB as described in steps 21 through 21 through 24 of the task analysis. Wait 5 seconds for compliance.

   A. If *S* does not comply, follow procedures indicated in section 1.A. of the teaching procedures.

   B. When *S* complies with instruction, provide consequences as described in 1.B. of the teaching procedures.

5. Given instructions "Mindy, climb up," *S* will ascend the climbing bars as indicated in steps 25 through 31 of the task analysis. Wait 5 seconds for compliance.

   A. If *S* does not comply, follow procedures indicated in 1.A. of the teaching procedure section.

   B. When *S* complies with instruction provide consequences as described in 1.B. of the teaching procedures.

6. Given instructions "Mindy, climb over," *S* will negotiate the top bar as described in steps 31 through 46 of the task analysis. Wait 5 seconds for compliance.

   A. If *S* does not comply, follow procedures indicated in 1.A. of teaching procedures.

B. When *S* complies with instructions, provide consequences as described in 1.B. of the teaching procedures.

7. Given instructions "Mindy, climb down," *S* will descend the climbing bars as indicated in steps 47 through 62 of the task analysis. Wait 5 seconds for complaince.

   A. If *S* does not comply, follow procedures indicated in 1.A., of the teaching procedures section.

   B. When *S* complies with instruction, provide consequences as described in 1.B. of the teaching procedures.

8. Given instructions "Mindy, move hands down," *S* will grasp a lower rung as described in steps 63 through 66. Wait 5 seconds for compliance.

   A. If *S* does not comply, follow procedures indicated in section 1.A. of the teaching procedures.

   B. When *S* complies with instructions, provide consequences as indicated in 1.B. of the teaching procedures.

9. Given instructions "Mindy, climb down," *S* will descend the climbing bars as indicated in steps 67 through 77 of the task analysis. Wait 5 seconds for compliance.

   A. If *S* does not comply, follow procedures indicated in section 1.A. of the teaching procedures.

   B. When *S* complies with the instructions, provide consequences indicated in 1.B. of teaching procedures.

10. Transfer of training and generalization of considerations include practice with climbing bars in different settings than where the original training took place, in the midst of distracting stimuli and with other teachers.

    A. Mindy will successfully ascend, traverse and descend the climbing bars 3 out of 4 times under the following conditions:

       1) With the climbing bars located in a different part of the classroom. That is, in a location other than where the primary training took place.

2) With the climbing bars located either in the open space area at Van Meter or outdoors on the play ground.

3) With another teacher acting as instructor.

B. A note should be sent home to Mindy's parents indicating she has mastered a new skill and if they have an opportunity for her to demonstrate this skill in a nearby park, they are encouraged to have Mindy do so.

Task Analysis Teaching Procedures: Sliding

Prerequisite Skills:

1. Can walk.
2. Can climb up stairs or steps.
3. Can appropriately use hand rails to support body weight while standing on steps.
4. Can understand words "up," "down" and "sit."

Task Analysis: Slide

1. Climb up steps of slide.
2. Use hands on railing while ascending steps.
3. Stand or crouch with both feet on top of metal slide.
4. Use hand to support body weight while lowering self to sitting position.
5. Assume sitting position at crest of slide.
6. Move body weight to a point beyond crest of slide.
7. Release grasp of hands on railing.
8. Descend on slide with feet out in front.
9. Get up from floor at base of slide.
10. Assume standing position.

Teaching Procedures: Slide

Given instructions "Mindy, climb up," *S* will ascend the steps of the slide as indicated in steps 1-2 of TA. Wait 5 seconds for compliance.

Given instructions "Mindy, sit down," *S* will assume a sitting position on slide as indicated in steps 3-5 in TA. Wait 5 seconds for compliance.

Given instructions "Mindy, slide down," *S* will descend the slide as indicated in steps 6-10 of TA. Wait 5 seconds for compliance.

If S does not comply:

1. Provide auditory prompt in the form of tapping on slide where appropriate move should occur and repeat instructions. Wait 5 seconds for compliance.
2. Provide full physical prompt if necessary while repeating instructions. Wait 5 seconds for compliance.

If S does comply:

1. Provide verbal reinforcements such as "Good work," "That's right, "Good Mindy." See step 1.B. (2) of teaching procedures of climbing bar for specifics on frequency of reinforcement.
2. Provide opportunity for gross motor activity of *S's* choice. See step 1.B.(3) of teaching procedures on climbing bar for specifics on frequency of reinforcement.

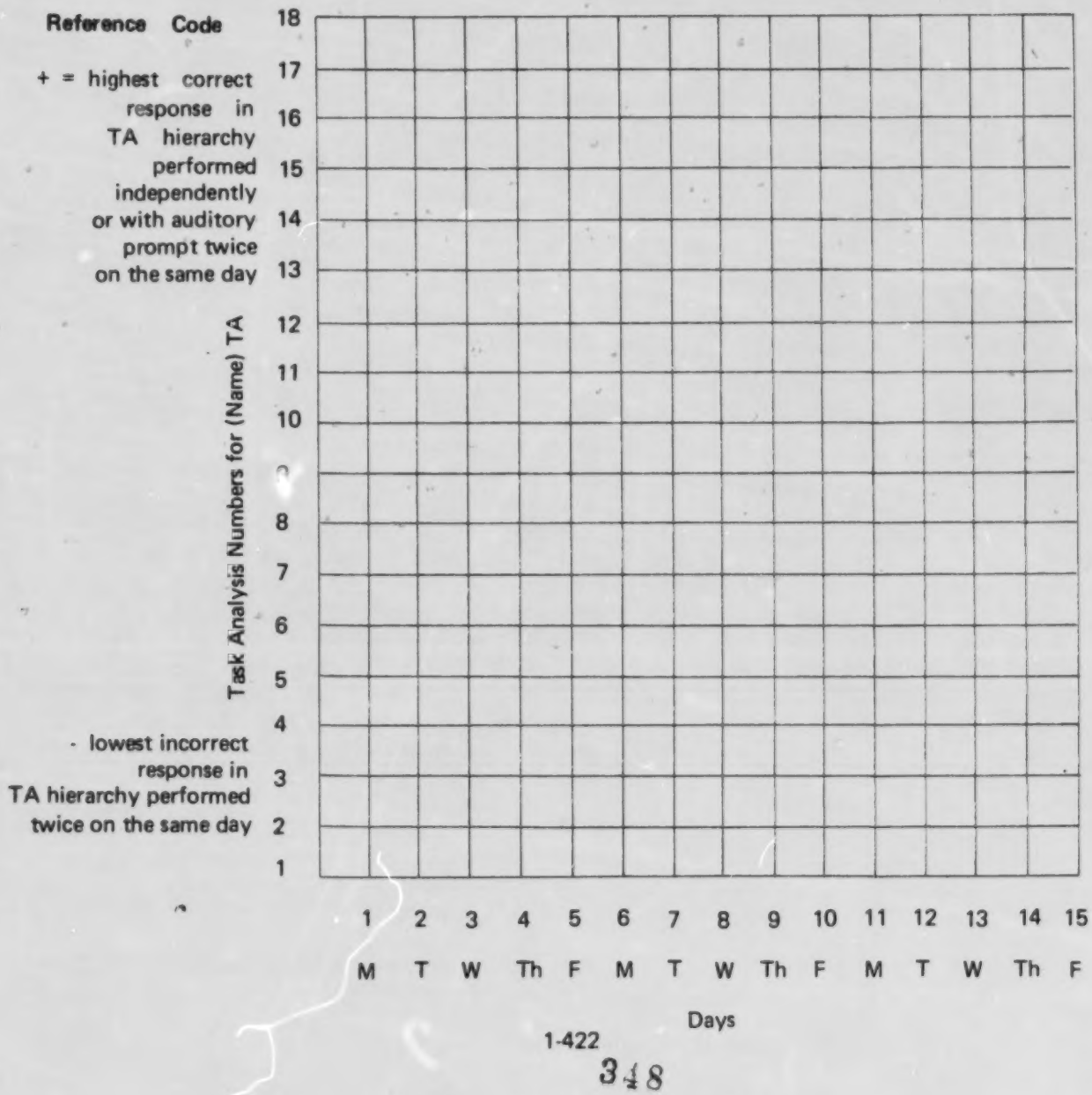
Transfer of training:

1. Provide practice on slide in nearby park.
2. Have *S* slide down slide with another instructor present (not trainer on program).
3. Have *S* participate in parallel play with other children using the slide.

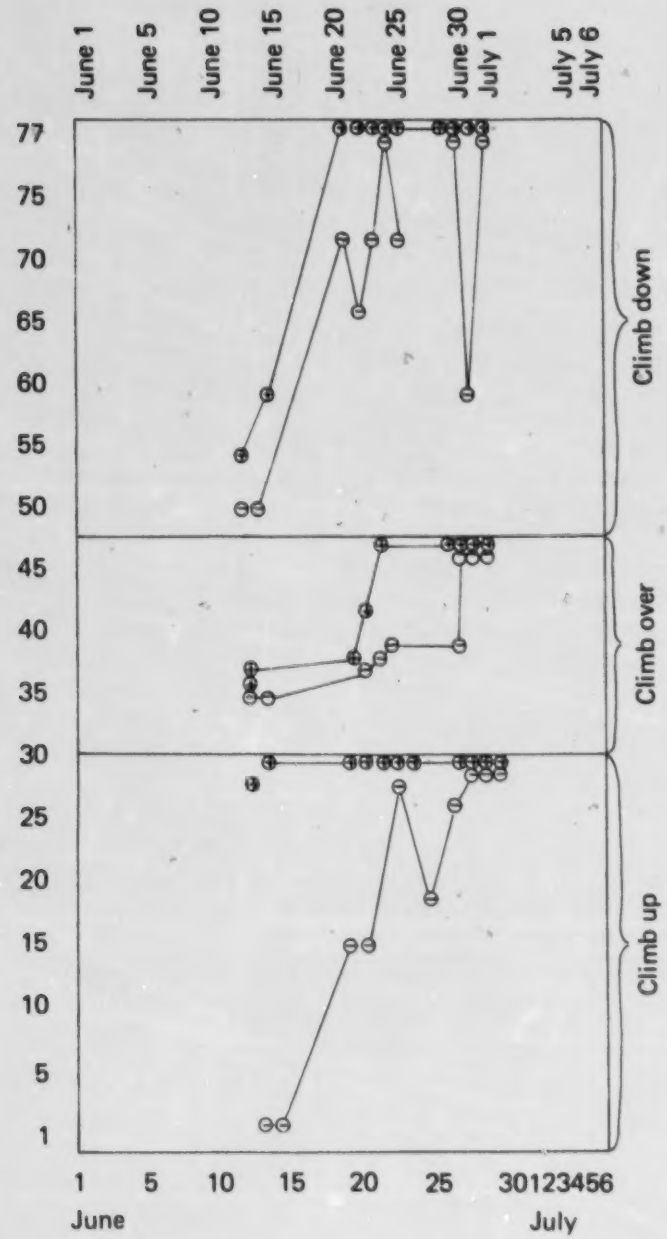
Data Collection Procedures

Information on Mindy's progress in learning climbing and sliding skills was collected on a daily basis using task attainment measures of last correct and first incorrect response in the task analysis hiearrarchy.

A graph would appear as indicated below with numerical listing of tasks in the task analysis hierarchy on the absissa and the days on the ordinal of the graph. The pupil must have two incorrect responses, i.e., not performed within 5 seconds with auditory prompts (if needed) to be considered as incorrect. The lowest task (smallest number in TA hierarchy) meeting this criteria would be considered the "lowest incorrect response." Conversely, the highest task (largest number in TA hierarchy) performed correctly on two occasions in the day is considered the "highest correct response." The highest correct response may be prodcued without prompts or may be performed with auditory prompts.



Student = Mindy B.
Date = June 14, 1977
to
July 1, 1977



+ = highest correct response in TA hierarchy performed correctly (independent or with auditory cues/prompts) twice on same day during 20 minute trial period

- = lowest incorrect response in TA hierarchy performed twice in the same day during 20 minute training period.

Results and Discussion

Climbing Bars

Prior to initiating training, Mindy had some skills required to ascend and descend climbing bars but she did not have skills to climb over the top of the bars. For example, she could grasp with hands, elevate her body and move feet up and down on the bars. The problem was one of quality of responding: Mindy's feet often slipped, she proceeded very rapidly and would try to jump down two steps when descending to speed up the process of getting off the bars. In essence, she could not enjoyably or safely engage in this activity as part of her independent play.

Mindy recieved 14 days of instruction on the climbing bars and she demonstrated marked improvement and is currently receiving transfer training experiences. Transfer training involves moving the climbing bars to another portion of the classroom for practice and moving the climbing bars out into the open space areas. Later she will receive experience with another teacher giving her instructions to climb.

The two most significant contributors to the success of the program were (1) the utilization of an effective reinforcer (the rocking chair) to give a break in the training trials and (2) the use of auditory cues in the form of tapping to indicate where the next response should be for Mindy. Both of these ideas were offered by the team leader. Auditory cues provided direction to the student (when she received physical prompts she often went limp) without interferring with the climbing.

Slide

The slide proved to be an interesting experience which required very little organized instruction because practice with the climbing bars transferred to sliding. The only negative carry over is that Mindy does not always stand up on the slide before sitting down (step 3 in TA). Rather, she uses the same body pattern as the climbing bar which involves "throwing" the left leg over the high point first then sitting down on the slide. Correction procedures were not initiated as this seemed to be an acceptable procedure for sliding, and retraining the pattern for sliding might be disruptive to her learning and retention of skills on the climbing bars.

Recommendations

First, it would be helpful for the teacher for the 1977-78 school year to encourage practice with the climbing bar and slide as a way to maintain skills and provide an opportunity for parallel play. Mindy enjoys these activities and they could, I believe, be used effectively as a reinforcer after completing other activities.

Secondly, the parents should be told Mindy can climb and slide and should be encouraged to provide her with opportunities and support in participating in these activities.

Finally, auditory cues in the form of tapping to indicate the next instructional step proved to be more valuable for Mindy than repeating the verbalization of instructions. In Mindy's program next year the teacher should check out the effectiveness of this type of prompting in other pursuits.

Skill Development Checklist

The skill development checklist is to be used during practicum sessions. The participant under the direction of the supervisor should have an opportunity to assess and intervene in curricular areas. The participant's ability to apply information presented in the didactic sessions should be assessed through the use of regular observation sessions during ongoing practicum activities. The supervisor using the skill development checklist should evaluate participants at least twice during the inservice training program.

Assessment	Performance Level		
	(2) Yes	(1) Yes but needs improvement	(0) No
1. The participant will clearly define a given behavior within a curriculum area to be assessed.			
2. The participant will conduct an initial assessment using the same cues from trial to trial with a child in the *language* skill area.			
3. The participant will conduct an initial assessment using the same cues from trial to trial with a child in the *self-help* skill area.			
4. The participant will conduct an initial assessment using the same cues from trial to trial with a child in the *social/recreational* skill area.			
5. The participant will conduct an initial assessment using the same cues from trial to trial with a child in the *motor* skill area.			
6. The participant will conduct an initial assessment using the same cues from trial to trial with a child in the *vocational* skill area.			
7. The participant will discriminate appropriate situations in which to use elicited and observational assessment.			
8. The participant will complete a task analytic assessment in a selected *language* skill area.			
9. The participant will complete a task analytic assessment in a selected *self-help* skill area.			
10. The participant will complete a task analytic assessment in a selected *social/recreational* skill area.			
11. The participant will complete a task analytic assessment in a selected *motor* skill area.			

	Performance Level		
	(2) Yes	(1) Yes but needs improvement	(0) No
12. The participant will complete a task analytic assessment in a selected *prevocational/vocational* skill area.			
13. The participant will not offer feedback subsequent to a child's response.			
14. The participant will demonstrate proficiency in recording results obtained in conducting an assessment.			
15. The participant will graph results of assessment data.			
16. The participant will demonstrate use of time sampling techniques.			
17. The participant will compute and rate data accurately.			
Intervention			
18. The participant will get the student's attention before beginning instruction.			
19. The participant will give clear instructions to the student (head-on and brief).			
20. The participant will model appropriate target behavior if necessary.			
21. The participant will provide appropriate physical assistance, if necessary, for the student to engage in target behavior.			
22. The participant will provide instruction at the appropriate entry level.			
23. The participant will give verbal reinforcement enthusiastically.			
24. The participant will give the reinforcement immediately, i.e., within two seconds of correct response.			
25. The participant will give a reinforcement for correct responses in accordance with selected reinforcer schedule.			

	Performance Level		
	(2) Yes	(1) Yes but needs improvement	(0) No
26. The participant will give physical reinforcement appropriately.			
27. The participant will withhold reinforcements correctly.			
28. The participant will demonstrate a systematic procedure in selecting the appropriate reinforcement schedule.			
29. The participant will implement correctly the selected reinforcement schedule.			
30. The participant will gradually decrease assistance as a student becomes more proficient in demonstrating the target behavior.			
31. The participant will determine when to administer an alternative correction procedure.			
32. The participant will prepare training materials, data sheets, etc. before beginning instruction.			
33. The participant will be able to arrange children in small groups to minimize disruptive behavior.			
34. The participant will be able to determine the appropriate amount of time to provide instruction for a student or group of students.			
35. The participant will be able to select a variety of activities and materials which are appropriate in teaching a given skill.			
36. The participant will ignore inappropriate behavior.			
37. The participant will ignore inappropriate behavior and selectively reinforce appropriate behavior.			
38. The participant will train one task at a time in an instructional situation.			
39. The participant will provide a reasonable number of trials for the student to learn target behavior.			
40. The participant will label reinforcement contingency - i.e., tell child why he/she is being reinforced.			

	Performance Level		
	(2) Yes	(1) Yes but needs improvement	(0) No
41. The participant will administer time-out procedures appropriately.			
42. The participant will adhere to predetermined criterion levels in the administration of the program.			
43. The participant will implement a program effectively with a small group.			
44. The participant will manage children effectively during small group instruction.			
45. The participant will reinforce students exhibiting appropriate behaviors in a small group that are not being worked with directly.			
Transfer of Training			
46. The participant will demonstrate proficiency in programming transfer of training by utilizing a second *trainer*.			
47. The participant will demonstrate proficiency in programming transfer of training by utilizing a second *environment*.			
48. The participant will demonstrate proficiency in programming transfer of training by utilizing a second *activity*.			

Pretest with Key

PRETEST – SYSTEMATIC INSTRUCTION

Mark which of the following are behavioral objectives:

1. The student will understand the basic facts of addition at the end of second grade. (True or False).

2. The student will shoot baskets with improved accuracy each day. (True or False).

3. Shooting from the foul line on a basketball court, the student will make 7 out of 10 shots go through the hoop. (True or False).

4. Mark the item(s) that *cannot* be used to assess the child.

   a. Task analysis
   b. Positive reinforcement
   c. Interviewing previous teachers
   d. Behavioral objectives
   e. Formal tests
   f. Direct observation

5. What is entry level skill in a task analysis sequence; how does it relate to initial assessment?

6. Describe how time-sampling could be used to assess body-rocking behavior.

7. What is the criterion of ultimate functioning and how does it relate to prioritizing objectives for students?

PRETEST KEY

1. F

2. F

3. T

4. b and d

5. Entry level skills are the present functioning level of the student in a given content area; they are important to assessment because the teacher finds out specifically where to begin instruction with the child.

6. a) Twenty-minute periods throughout the day could be established.

   b) The first 20 seconds of each minute an observation of the target behavior (body-rocking) would take place.

   c) Pluses equal no body rocking; minuses equal body rocking.

   d) A percentage of pluses and minuses at the end of each day would indicate the level of rocking.

7. The criterion of ultimate functioning is an effort to identify the eventual level of functioning of the child; this will facilitate program planning for the child and lead to setting objectives which are of the most critical importance in school, home, and the community.

Post-test with Key

POST TEST – SYSTEMATIC INSTRUCTION

1. Describe the three components of a behavioral objective.

2. Do a task analysis of combing hair.

3. Sequence the steps of systematic instruction by numbering the items 1 to 8 from the first to the last step.

   ____ Implement the instructional plan and measurement procedures
   ____ Establish short term objectives
   ____ Assess
   ____ Modify the plan based on data
   ____ Develop and write measurement procedures
   ____ Develop and write instructional plan
   ____ Evaluate overall progress
   ____ Establish long term objectives

4. Given the following percentage of correct responses in a motor imitation program over 10 days (8%, 9%, 15%, 44%, 62%, 50%, 90%, 40% 45%, 60%) graph this information.

5. Describe how rate data can be utilized in assessing work rates of students through an example; what is an advantage of rate data?

POST TEST - KEY

1. Criteria; description of behavior; conditions.

2. Minumum of five steps required in logical order.

3. 6
   3
   1
   7
   4
   5
   8
   2

4. 10 points given, 1 for each correct point plotted.

5. The advantage of rate data is that it can be used over varied lengths of instructional time each day; rate data is computed by dividing the total units completed by the total time the child was engaged in instruction.

   Example: 20 units completed in 60 minutes

   $\frac{20}{60}$ = .33 rate

Bibliography

Assessment

Assessment tools for use with the severely multiply handicapped. Kansas State Department of Education, Topeka, Ks., 1976.

Eaves, R. C., & McLaughlin, P. A systems approach for the assessment of the child and his environment: getting back to basics. Journal of Special Education, 1977, 11(1), 99-111.

Knapczyk, D. Task analytic assessment of severe learning problems. Education and Training of the Mentally Retarded, 1975, 10(2), 74-77.

Sailor, W., Horner, R. D. Educational assessment strategies for the severely handicapped. In N. Haring & L. Brown (Eds.), Teaching the severely handicapped. New York: Grune & Stratton, 1976.

Somerton, M. E., & Turner, K. D. Pennsylvania training model individual assessment guide. Penn. Dept. of Education, Harrisburg, Pa., 1975.

Individualized Education Programs
A Primer on Individualized Education Programs for Handicapped Children.

Scottie Torres (Ed.). Reston, Virginia, The Foundation for Exceptional Children, 1977.

Functions of the Placement Committee in Special Education -- A Resource Manual.

National Association of State Directors of Special Education Washington, D.C. - 1976.

Objectives

Bateman, B. The essentials of teaching. Sioux Falls, South Dakota: Adapt Press, Inc. 1971.

Brown, L., Nietupski, J. & Hamre-Nietupski, S. The criterion of ultimate functioning and public school services for severely handicapped students. In Hey, Don't Forget About Me: New Directions for Serving the Severely Handicapped. Reston, Va., CEC.

Mager, R. F. Preparing instructional objectives. Belmont, California: Fearon Publishers, 2nd Edition, 1977.

Wheeler, A. H., & Fox, W. L. Managing behavior 5: Behavior modification: A teacher's guide to writing instructional objectives. Lawrence, Kansas: H & H Enterprises, Inc., 1972.

Observation

Bancroft, J., & Bellamy, C. T. An apology for systematic observation. Mental Retardation, 1976, 14(5), 27-30.

Coller, A. R. Systems for the observation of classroom behavior in early childhood education. Reston, VA, Eric Clearinghouse on Early Childhood Education, 1972.

Gardner, W. I. Defining and measuring behavior, Chapter 8 in Children With Learning and Behavioral Problems.

Liberty, K. Dada dilemma: Response and measurement units for teachers of severely handicapped children. AAESHP Review, 1976, 1(5).

Hansen, M. & Bellamy, G. T. Continuous measurement of progress in infant intervention programs. Education and Training of the Mentally Retarded, 1977, 12(1), 52-59.

Cooper, J. O. Measurement and Analysis of Behavioral Techniques. Part 1, 6-59. Columbus Ohio: Charles Merrill, 1974.

Eaton, M. and Lovitt, T. Achievement tests vs. direct and daily measurement. In G. Semb (Ed.) Behavior Analysis and Education - 1972. Lawrence, Univeristy of Kansas Press, 1972.

Jenkins, J., Mayhall, W., Peschka, C., and Townsend, V. Using direct and daily measures to increase learning. Journal of Learning Disabilities, 1974, 10(7), 14-17.

Program Evaluation

Airasian, P. W. The role of evaluation in mastery learning. In J. H. Block (Ed.), Mastery learning. New York, Holt, Rinehart, Winston, Inc., 1971.

Bricker, D. D. Educational Synthesizer. In Hey, Don't Forget About Me. Education's Investment in the Severely, Profoundly, and Multiply Handicapped. Reston, VA: Council on Exceptional Children, 1976.

Dougherty, E., & Dougherty, A. The daily report card: a simplified and flexible package for classroom behavior management. Psychology in the Schools, 1977, 14 (2), 191-196.

Freschi, D. F. Where we are, where we are going, how we're getting there. Teaching Exceptional Children, 1974, 6(2), 89-97.

Gentry, D., & Haring, N. G. Using probes and daily measurement to insure pupil progress. Unpublished manuscript, Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington, Seattle, 1973.

Hartman, D., & Hall, R. V. The changing criterion design. Journal of Applied Behavior Analysis, 1976, 9(4), 527-532.

Hersen, M. & Barlow, D. Single case experimental designs. New York: Pergamon, 1977.

Kazdin, A. E. Behavior modifications in applied settings. Homewood, Ill.: Dorsey Press, 1975.

Lovitt, T. C., Kunzelmann, H. P., Nolen, P. A., & Hulten, W. J. The dimensions of classroom data. Journal of Learning Disabilities, 1968, 1(12), 710-721.

Schumaker, J., Hovell, M., & Sherman, J. An analysis of daily report cards and parent-managed privileges in the improvement of adolescents' classroom performance. Journal of Applied Behavior Analysis, 1977, 10, 449-464.

Sloane, H., & MacAulay, B. (Eds.), Operant procedures in remedial speech and language training. Boston: Houghton-Mifflin, 1968.

Wehman, P., McLaughlin, P. Classroom program evaluation for exceptional children. Academic Therapy, 1977, in press.

Task Analysis

Allegheny Intermediate Unit 3. Perceptual Motor development curriculum. Pittsburg, Pa., 1974.

Allegheny Intermediate Unit 3. Special techniques for teaching the severely and profoundly retarded. Pittsburg, Pa., 1976.

Anderson, D.R., Hodson, G. D., & Jones, W. G. Instructional programming for the handicapped students. Springfield, Ill., Charles C. Thomas, 1975.

Baker, B. L. Steps to independence: A skills training series for children with special needs (Vols. 1-5). Champaign, Ill., Research Press, 1976.

Bender, M., Valletutti, P. J. Teaching the moderately and severely handicapped: Curriculum objectives, strategies, and activities (Vols 1 & 2). Baltimore, Md., University Park Press, 1976.

Brown, L. et al. Badger book series (Vols 3-6). Madison, Wisconsin, 1973-1976.

Fredericks, H.D. et al. A data based classroom for the moderately and severely handicapped. Monouth, Oregon, Instructional Development Corporation, 1975.

Fredericks, H. D. et al. The teaching research curriculum for moderately and severely handicapped. Springfield, Ill., Charles C. Thomas, 1976.

Hart, V. Beginning with the handicapped. Springfield, Ill., Charles C. Thomas, 1974.

Johnson, V. M., & Werner, R. A. A step-by-step learning guide for retarded infants. Syracuse, New York, Syracuse University Press, 1975.

Lent, J. et al. Project MORE: Daily Living Skills. 9 titles. Bellevue, Wash., Edmark Associates, 1974-1977.

Teaching Procedures

Addison, R., & Homme, L. The reinforcing event (RE) menu. National Society for Programmed Instruction Journal, 1966, 5, 8-9.

Baer, D. M., Peterson, R., and Sherman, J. The development of imitation by reinforcing behavioral similarity to a model. Journal of Experimental Analysis of Behavior, 1967, 10, 405-416.

Bandura, A. Positive Control. Chapter 4 in A. Bandura (Ed.), Principles of Behavior Modification. Chicago: Holt, Rinehart, and Winston, 1969.

Berkowitz, S., Sherry, P., and Davis, B. Teaching of self-feeding skills to the profoundly retarded using reinforcement and fading procedures. Behavior Therapy, 1971, 2, 61-67.

Blake, K. A. Teaching the retarded. Englewood Cliffs, N.J.: Prentice-Hall, 1974.

Blake, K. A. The mentally retarded: an educational psychology. Englewood Cliffs, N.J.: Prentice-Hall, 1976.

Christy, P. Does use of tangible rewards with individual children affect peer observers? Journal of Applied Behavior Analysis, 1975, 8(2), 187-196.

Corey, J. and Shamow, J. The effects of fading on acquisition and retention of oral reading. Journal of Applied Behavior Analysis, 1972, 5, 311-315.

Cotler, S., Applegate, G., King, L., & Kristal, S. Establishing a token economy program in a state hospital program: a lesson in training student and teacher. Behavior Therapy, 1972, 3, 209-222.

Dorry, G. and Zeaman, D. Teaching a simple reading vocabulary to retarded children: effectiveness of fading and nonfading procedures. American Journal of Mental Deficiency, 1975, 79, 627-631.

Gerwirtz, J., & Baer, D. Deprivation and satiation of social reinforcers as drive conditions. Journal of Abnormal and Social Psychology, 1958, 57, 165-172.

Gold, M. and Barclay, C. The learning of difficult visual discriminations. Mental Retardation, 1973, 11, 9-12.

Gold, M. W., and Scott, K. A. Discrimination learning in W. B. Stephens (Ed.) Training the Developmentally Young. New York, Day, 1971.

Kazdin, A. E. Behavior modification in applied settings. Homewood, Ill.: Dorsey Press, 1975.

Kazdin, A. E. The effect of vicarious reinforcement on performance in a rehabilitation setting. Education and Training of the Mentally Retarded, 1973, 8, 4-11.

Kazdin, A. E. Behavior Modification in Applied Settings. Homewood, Ill., Dorsey Press, 1975.

Lovaas, O. I., Koegel, R., Simmons, J., & Long, J. Some generalization and follow-up measures on autistic children in behavior therapy. Journal of Applied Behavior Analysis, 1973, 6, 131-166.

Lovitt, T. Applied behavior analysis and learning disabilities: Part I. September, 1975, Journal of Learning Disabilities.

Lovitt, T. Applied behavior analysis and learning disabilities: Part II. October, 1975, Journal of Learning Disabilities.

Loynd, J. and Barkley, A. A case study in developing ambulation in a profoundly retarded child. Behavior Research and Therapy, 1970, 8, 207.

Martin, G., England, G., and England, K. The use of backward chaining to teach bed-making to severely retarded girls: a demonstration. Psychological Aspect of Disability, 1971.

Myers, D. Sinco., R., & Stalma, M. The right-to-education child. Springfield, Ill.: Charles C. Thomas 1973.

Nelson, G., Cone, J. and Hanson, C. Training correct utensil use in retarded children: Modeling vs. physical guidance. American Journal of Mental Deficiency, 1975, 80, 114-122.

Panda, K. C. Social reinforcement: theoretical issues and research implications. Psychological Studies 1971, 26, 319-339.

Piaget, J. Play, dreams, and imitation. New York: W. W. Norton & Co., 1962.

Premack, D. Toward empirical behavior laws: I. Positive reinforcement. Psychological Review, 1959, 66, 219-233.

Redd, W. H. Effects of mixed reinforcement contingencies on adult's control of children's behavior, Journal of Applied Behavior Analysis, 1969, 2, 249-254.

Redd, W. H., & Birnbrauer, J. S. Adults as discriminative stimuli for different reinforcement contingencies with retarded children. Journal of Experimental Child Psychology, 1969, 7, 440-447.

Reynolds, G. S. A primer of operant conditioning. Glenview, Ill.: Scott, Foresman, & Co., 1968.

Tawney, J. Training letter discrimination in four year old children. Journal of Applied Behavior Analysis, 1972, 5, 455-465.

Touchette, P. The effects of graduated stimulus change on the acquisition of a simple discrimination in severely retarded boys. Journal of the Experimental Analysis of Behavior, 1968, 11, 39-48.

Uzgiris, I. & Hunt, J. McV. Instrument for assessing infant psychological development Urbana, Ill.: University of Illinois Press, 1975.

Wehman, P. Curriculum design for severely and profoundly handicapped students New York: Behavioral Publications, 1978.

Wehman, P. Task Analysis in recreation programs for the mentally retarded. Journal of Leisurability, 1977, 4(4).

Wehman, P. A leisure time activities curriculum for the developmentally disabled. Education and Training of the Mentally Retarded, 1976, 11(4), 24-27.

Whaley, D. and Malott, R. Elementary Principles of Behavior. New York, Appleton-Century-Crofts, 1971.

Williams, W. Procedures of task analysis as related to developing instructional programs for the severely handicapped. In L. Brown, T. Crowner, W. Williams, R. York (Eds.), Madison's Alternative for Zero Exclusion: A Book of Readings. Vol. V. Madison, Wisconsin: Madison Public Schools, 1975.

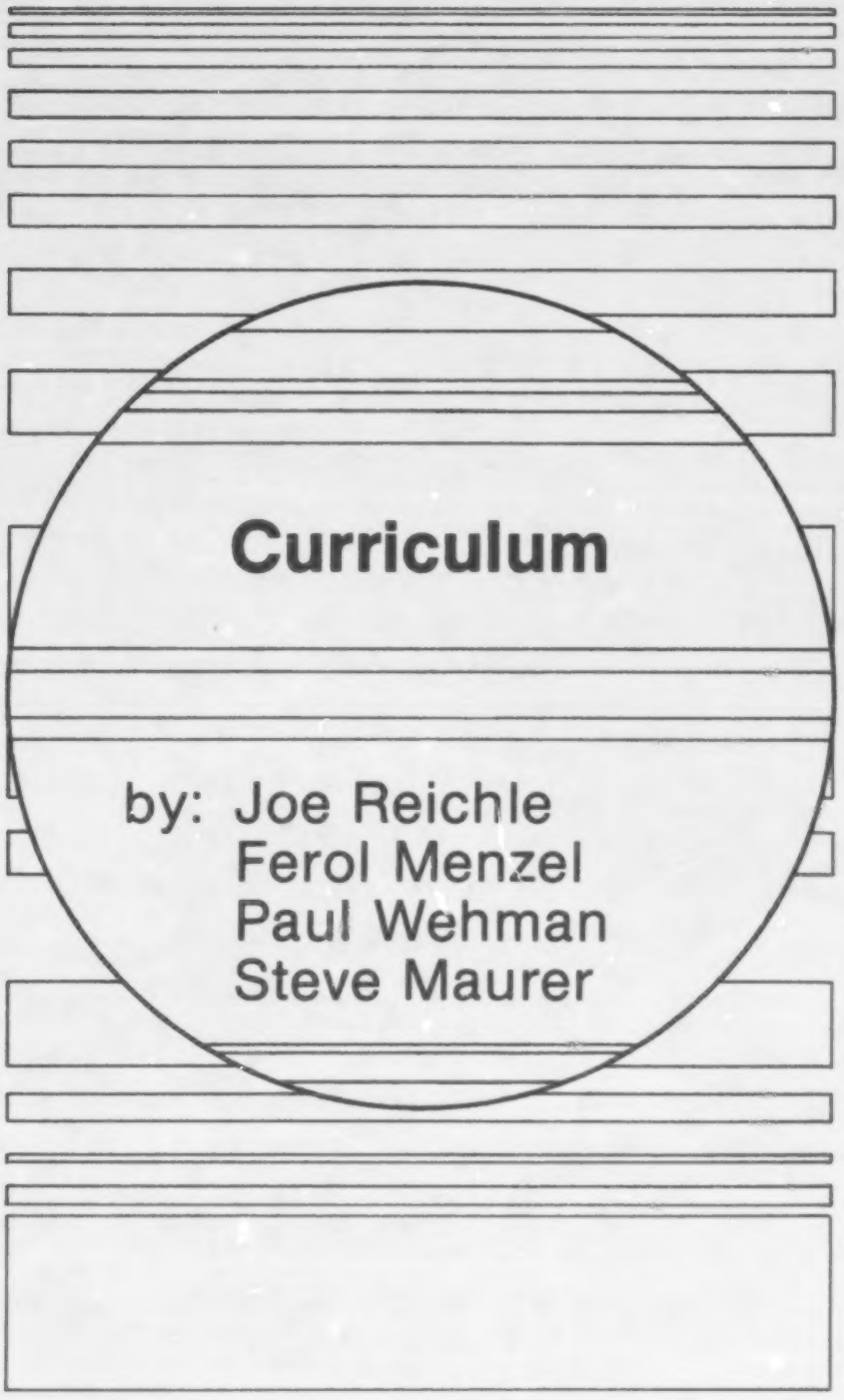
Williams, W. W., Brown, L., and Certo, H. Components of an instructional program for severely handicapped students. Theory and Practice, 1975, 14, 123-136.

Williams, W. W., & Gotts, E. Selected considerations in developing curriculum for severely handicapped students. In Educational Programming for the Severely and Profoundly Handicapped. Reston, VA: Council on Exceptional Children, 1977.

Transfer of Training:

Kazdin, A. E. Response maintenance and transfer of training. Chapter 9. In A. E. Kazdin, Behavior Modification in Applied Settings. Homewood, Ill., Dorsey Press, 1975.

Wehman, P., Abramson, M., and Norman. Transfer of training in behavior modification programs: an evaluative review. Journal of Special Education, 1977, 11(2), 217-231.


Curriculum
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Overview

Curriculum for the severely and profoundly handicapped child should not be viewed as a conglomeration of separate assessment and intervention packages in self-help, motor, cognition, communication and vocational training. Instead, curriculum should be viewed as the creation of a single plan of assessment and intervention that crosses all curriculum areas.

The rudiments of early communicative behavior, in addition to relying on the child's ever growing motor sophistication, seem to be correlated to several early cognitive skills. The relationship between self-help skills and the previously discussed curriculum areas is readily observable. Self-help skills require a variety of upper and lower extremity motor skills. The relationship between cognition and self-help skills is observable in several ways. The use of self-help utensils (e.g., toothpaste and toothbrush) requires that the child evidence cognitive skills involving causality, means/ends and space.

Communication skills exhibited by the child are critical in the original establishment of regulated use of self-help skills. Verbal instruction-following skills assist in the fading of manual prompts and motor cues in getting the child to wash his/her hands, comb his/her hair, etc. In establishing extended use of self-help skills, it is helpful if the child has developed some communicative behavior to express his/her need for further information upon not understanding a command.

The fact, then, that the child does not develop curricular skills in isolation suggests that assessment and intervention need not be done in curricular isolation. The goal of this module is to separate curricular areas presenting each in simplicity. Subsequent emphasis will be placed on the consolidation of curricular assessments whenever possible. The position will be taken that the most accurate and most efficient assessment of the child's behavior occurs in the child's natural environment and where the child has an opportunity to emit behaviors not restricted to a single curriculum area.

There is a substantial base of evidence suggesting that socially, cognitively, and communicatively, adults alter their interactive behavior dependent upon the chronological age of the child. Through observation in naturalistic environments, this interaction behavior is clearly observable. The sections that follow advocate the use of naturalistic observations as time permits. Additionally, we will advocate elicited assessment techniques when behaviors under observation are confounded by environmental events.

The organization of the curriculum module is done developmentally. In the majority of curricular areas, it has been demonstrated that severely intellectually delayed children develop in the same sequence but at a slower rate than normally developing children. For this reason, the module recommends a developmental basis for organizing the observation of the severely and profoundly handicapped child's development. At the same time, however, we suggest that present knowledge about normal development is in many ways insufficient to completely plan assessment and intervention activities, particularly with respect to self-help and daily living activities. There are a substantial number of behaviors, for example, upon whose frequency of occurrence we have very little normative data. Other behaviors exhibited by normal children are ones which are incorrect from an adult perspective and only later are corrected by the child. (e.g., negation -- early development -- "Me not want to go"; later--" I don't want to go.") In the case of delayed language, little argument can be advanced for training an incorrect behavior simply because it occurred in normal development. Clearly, the teacher that trains to developmental milestones without further rationale does the child a tremendous disservice.

There is another handicap in using strictly a developmental approach that cannot be overcome. There are some handicapping conditions that do not present themselves to the normally developing

child. For example, the establishment of signing behavior is not a normal development. Since a child developing a sign system is apt to have a variety of handicapping conditions, it is not likely that collecting developmental data would be particularly beneficial. In this instance remedial logic via task analysis from an adult perspective may be most useful.

In summary, this module is geared to both the developmentalist and the behaviorist. It emphasizes viewing the interrelationship among curricular areas. Additionally, our approach in this module suggests the use of developmental data as the basis for task analysis unless there is specific evidence suggestive of a more efficient means of organizing skills to be trained.

Objectives

General Objectives

Motor Curriculum

1. The participant will become aware of the developmental sequence of a) gross motor and b) fine motor skills.
2. The participant will gain a general understanding of techniques used to assess gross and fine motor behavior.
3. The participant will gain a general understanding of developmentally appropriate gross and fine motor intervention activities.

Self-Help Curriculum

Toilet Training

1. The participant will understand how to clock train non-ambulatory severely/profoundly handicapped students.

2. The participant will understand how to toilet train ambulatory severely/profoundly handicapped students.

3. The participant will understand how to implement a rapid toilet training program with severely/profoundly handicapped students.

Feeding Training

1. The participant will learn basic considerations such as positioning, safety factors and basic techniques for feeding dependent and semi-dependent feeders.

2. The participant will learn how to recognize feeding problems and how to minimize difficulties presented by them.

Dressing Training

1. The participant will review and know general developmental milestones regarding dressing skills.

2. The participant will learn basic considerations such as readiness of child, body balance, and range of motion for teaching a child dressing and undressing skills.

3. The participant will learn several methods of dressing and undressing specifically used with the physically handicapped.

Communication Curriculum

1. The participant should establish an understanding of the sequence of communication acquisition in normally developing children.

2. The participant should establish an understanding of the critical dimensions of early communicative assessment and currently available protocols designed to evaluate early communicative behavior.

3. The participant should establish an understanding of a selected and representative sample of currently available early communication intervention protocols.

Cognition, Play and Socialization Curriculum

1. The participant will demonstrate knowledge of the general sequence of social development in the normal child from birth to age three.

2. The participant will possess quantifiable understanding of the interaction between social, cognitive, motor and communicative development.

3. The participant will demonstrate knowledge of the potential effects of social behavior upon attempts to assess and intervene in motor, communicative, self help and play curriculums.

4. The participant will demonstrate knowledge of the progressive sophistication of play behavior with respect to the awareness and utilization of the environment in play.

Vocational Curriculum

1. The participant will learn how to develop a vocational training program for severely and profoundly handicapped persons.

2. The participant will learn how to analyze learning and production problems typically encountered in severely and profoundly handicapped workers.

Specific Objectives

Motor Curriculum

1. The participant will know the seven general rules of normal development.

2. The participant will be able to describe the following primitive reflexes:

   a) Moro
   b) Tonic labyrinthine - prone
   c) Tonic labyrinthine - supine
   d) Symmetrical tonic neck reflex
   e) Asymmetrical tonic neck reflex
   f) Neck righting
   g) Parachute
   h) Positive supporting
   i) Plantar grasp
   j) Labyrinthine and optical righting
   k) Landau

3. The participant will be able to describe the typical sequence of events in the acquisition of:

   a) sitting
   b) crawling
   c) standing
   d) walking
   e) grasping
   f) reaching and object manipulation
   g) advanced locomotion

Self-Help Curriculum

Toilet-Training

1. The participant will understand how to take baseline records prior to toilet training.
2. The participant will demonstrate how to analyze baseline data for selection of training times.
3. The participant will understand the basic prerequisite skills required for toilet training.
4. The participant will understand how to conduct a toilet training session.
5. The participant will understand how to develop a nighttime toilet training program.
6. The participant will identify and describe the principle components involved in rapid toilet training.
7. The participant will understand how to deal with and manage special toileting problems such as refusal to sit on the toilet and feces smearing.

Feeding Training

1. The participant will list five problems in feeding often present in persons with central nervous system damage.
2. The participant will demonstrate proper positioning techniques in order to assist feeding process in students.
3. The participant will demonstrate techniques to facilitate swallowing, straw-drinking, chewing, self-feeding.

Dressing Training

1. The participant will demonstrate knowledge of developmental sequence of dressing and undressing.
2. The participant will demonstrate knowledge of cognitive and body balance requisites relevant to dressing.
3. The participant will demonstrate and verbally describe undressing methods used with children.
4. The participant will demonstrate and verbally describe dressing methods used with children.

Communication Curriculum

Sequence of Communication Acquisition

1. The participant should establish an understanding of the sequence in which the child comes to demonstrate early environmental awareness.
2. The participant should establish an understanding of the sequence of early initiated precommunicative behavior.
3. The participant should establish an understanding of early interactive sequences of behavior occurring between adult and child.

4. The participant should establish an understanding of the sequence in which early semantic communicative comprehension skills develop.

5. The participant should establish an understanding of the sequence in which early semantic production develops.

Assessment

6. The participant should establish an understanding of the procedures used in assessing early environmental and early communicative awareness.

7. The participant should establish an understanding of procedures used to assess early communicative comprehension.

8. The participant should establish an understanding of procedures used to assess early communicative production.

9. The participant should establish an understanding of considerations in the assessment of augmentative communication modes.

Intervention Section

10. The participant should establish an understanding of the methods used in the language program developed by Guess, Sailor and Baer.

11. The participant should establish an understanding of the methods used in the language program developed by Kent.

12. The participant should establish an understanding of the methods used in the language program developed by Bricker & Bricker.

13. The participant should establish an understanding of the methods used in the language program developed by MacDonald.

14. The participant should establish an understanding of the methods used in the language program developed by Reichle & Yoder.

15. The participant should establish the understanding necessary in order to appropriately discuss the similarities and dissimilarities of these programs.

16. The participant should establish an understanding of the application of principles used in existing communicative programming to the use of augmentative communication devices.

Cognition, Play and Socialization Curriculum

1. The participant should demonstrate the skills necessary to rank order social and play skills exhibited by a child and predict a level of function based on sensorimotor and early preoperational play scales.

2. The participant should demonstrate the ability to list, define and explain the features of isolated, parallel and cooperative play.

3. The participant should demonstrate the ability to predict the qualitative aspects of a child functioning between birth and three years based on knowledge of his/her motor and cognitive level of functioning.

4. The participant should demonstrate the ability to describe the importance of quantitative as well as qualitative aspects of sensorimotor and early preoperational play.

5. The participant should demonstrate the ability to outline a corpus of assessment, program content, and instructional methods for the establishment of social or play behavior in a severely/profoundly handicapped child chosen at random in the practicum site.

Vocational Curriculum

1. The participant will recognize and understand the continuum of work placements which are available to severely handicapped workers.

2. The participant will recognize and understand the importance of selecting vocational skills which are relevant and available in the community in which the trainee lives.

3. The participant will learn how to perform task analytic assessment of a vocational skill.

4. The participant will recognize and understand how to employ techniques such as task analysis, easy-to-hard sequencing, color coding, modeling, prompting, instructions, and positive reinforcement with learning problems and production problems.

5. The participant will recognize and understand the importance of trainees exhibiting basic social skills, e.g., getting to work on time in the work situation.

Materials

Instructor

- slide projector
- screen
- carousel for slides
- video tape monitors
- video tape deck
- overhead projector
- blank transparencies
- transparency markers
- mats
- large ball
- inflated roll
- potty chair
- rag doll
- two preschool chairs
- eating utensils and plate
- adult size chairs
- large shirts, sweaters and other outer clothing
- *Uzgiris - Hunt Assessment Scale*
- "Try Another Way" film series
- Transparencies Nos. 1-27

Participant

- note pad
- pens and pencils
- 1 copy of general and specific objectives per participant
- 1 copy of bibliography per participant
- 1 copy of "Handling the Young Cerebral Palsied Child at Home" by Nancie Finnie per participant
- 1 copy of "The First Three Years" by Burton White per participant
- 1 copy of *Uzgiris-Hunt Assessment Scale* per participant
- 1 copy of "Toilet Training the Handicapped Child" per participant
- 1 copy of "Feeding Assessment and Therapy for the Neurologically Impaired" per participant
- 1 copy of "Dressing Techniques for the Physically Handicapped" per participant
- 1 copy of "Prelanguage Development Chart" per participant
- 1 copy of "Communication Behavior for the SPMR: . . ." per participant
- 1 copy of "Instructional Strategies for Improving Toy Play Skills of Severely Handicapped Children" per participant
- 1 copy of "A Recreation Curriculum for Developmentally Disabled Persons" per participant
- 1 copy of "Vocational Training of the Severely Retarded: Expectations and Potential" per participant
- 1 copy of "Behavioral Training Strategies in Sheltered Workshops for the Severely Developmentally Disabled" per participant

Methodology

Motor Curriculum

Instructor Note: In preparation for the lecture, the instructor (physical therapist and/or occupational therapist) should study the material found in the physical management module as well as the cognitive section of this module.

30 minutes Pretest

20 minutes

1. The instructor will present seven general rules which apply to normal development of motor sequences using Transparency No. 1.

5 minutes

2. The instructor will discuss the distinction between the terms growth and development using Transparency No. 2

90 minutes

3. The instructor will now discuss the characteristics of each early reflex listed on Transparency No. 3 by using personal media materials and the following video tapes: "Basic Care and Handling", University Hospital School, Color 3/4 inch video cassette, U-Matic, HS No. 26000, University of Iowa, Iowa City, Iowa 52242. "A Normal Baby: The Sensory Motor Process of the First Year", University Hospital School, Black/White 3/4 inch video cassette, U-Matic, HS No. 26002, University of Iowa, Iowa City, Iowa 52242. Emphasis should be placed on the relation of these reflexes to the demonstration of early sensory awareness.

240 minutes

4. The instructor will discuss the developmental progression of gross motor and fine motor behavior with special emphasis between motor and early cognitive development using the above mentioned video tapes, personal media materials and Transparencies Nos. 4-10.

Self-Help Curriculum

Toilet Training

5. The instructor will hand out "Toilet Training the Handicapped Child" (Handout No. 1). Instructor will use this handout as the basis for lecture notes.

15 minutes

6. The instructor will discuss the prerequisite skills required of toilet training in the educational curriculum, and their importance.

30 minutes

7. The instructor will discuss how to develop a toilet training record sheet (refer to Transparency No. 11).

30 minutes

8. The instructor will discuss how to analyze baseline data for type of training technique and selection of training times.

30 minutes

9. Clock training for non-ambulatory students will be described.

60 minutes

10. The instructor will describe in detail how to conduct a rapid toilet training program; a demonstration with a potty chair and volunteer should be carried out (refer to Transparencies Nos. 12-14).

15 minutes

11. The instructor will describe how to modify rapid toilet training into a more traditional toilet training program.

30 minutes

12. The instructor will briefly outline how to implement a nighttime toilet training program.

30 minutes

13. The instructor will describe how to alleviate special toilet problems such as feces smearing.

Feeding

60 minutes

14. Using the article, "Feeding Assessment and Therapy for the Neurologically Impaired" as a handout (No. 2) and as lecture notes, the instructor (occupational therapist) will discuss and demonstrate basic techniques for feeding a central nervous system damaged child (refer to chapter 9 of *Handling the Young Cerebral Palsied Child at Home* by Nancie Finnie for further information).

60 minutes

15. The instructor will explain behavior modification techniques such as behavioral chaining which can be used when teaching children to feed themselves (refer to behavior management module).

50 minutes

16. The instructor will have participants demonstrate and practice techniques with each other.

Dressing

60 minutes

17. The instructor (occupational therapist) will distribute and discuss "Dressing Techniques for the Physically Handicapped" (Handout No. 3).

30 minutes

18. The instructor will demonstrate procedures and have participants practice with each other.

Communication

Communication Development

30 minutes

19. The instructor will present a brief overview of communicative awareness using lecture notes and discussion of Handout No. 4 - "Prelanguage Development Chart".

20 minutes

20. The instructor will present a brief lecture on the child's early responses to and the topography of visual stimuli. Emphasis should be placed on the role of vision in the exhibition of early situational comprehension and the use of comprehension strategies. (Transparencies No. 15 and 16).

20 minutes

21. The instructor will present information on the communicative functions attributable to the use of motor behavior (the instructor should allude to the previous discussion of early motor behavior).

20 minutes

22. The instructor will demonstrate variables the clinician may control in the presentation of both auditory and visual stimuli and present

examples of the variety of child responses to each of the stimulus presentations demonstrated.

45 minutes

23. The instructor will present information on the emergence of early verbal/vocal behavior. The instructor should carefully describe the emergence of verbal skills that will lead to later acquisition of verbal imitations.

15 minutes

24. The instructor will break the class into dyads and randomly ask the dyads to demonstrate developmental levels of imitation (contagion, child-initiated, adult initiated).

35 minutes

25. The instructor will present information on early understanding emphasizing the differences between situational and linguistic comprehension. Participants should be requested to give examples of each type of comprehension discussed. Instructor will provide role played examples of situations that supposedly demonstrate language comprehension: Each example will then be analyzed in terms of the redundant cues provided by the assessor. Definitions of each of these comprehension strategies will be provided.

30 minutes

26. The instructor will provide information describing the first production of words including their semantic intent. Participants will be asked to provide examples of each semantic function described. The instructor will also provide a variety of examples of a single word used to express a variety of semantic functions and participants will name the function demonstrated.

30 minutes

27. The instructor will present information on the transition between one and two word utterances and provide examples of successive one word utterances. Participants will be requested to provide examples. The instructor will then ask participants to speculate on the possible combinations exhibited in children's two word utterances based upon what was presented regarding single word production. The instructor then will discuss the child's ability to comprehend multiple word utterances (in this discussion the instructor will allude to his/her previous discussion of comprehension strategies).

30 minutes

28. The instructor will present relative frequency production of common two word utterances.

30 minutes

29. The instructor will present information on syntactic comprehension, which will include information on the developmental progression of productive syntactic skills. The instructor will also present information on the different interpersonal uses of communicative turntaking: a) respond, b) initiate and c) continue.

30 minutes

30. The instructor will describe alternate and/or augmentative initiation - response modes used by delayed and/or devient communicators (Transparencies No. 17-20).

Communicative Assessment

25 minutes

31. The instructor will present an overview of this section discussing

areas of consideration in the assessment of the child's early communicative behavior.

45 minutes

32. The instructor will lecture on audiological management.

120 minutes

33. The instructor will expose participants to procedures for behavioral assessment of auditory function in infants and other difficult-to-test populations.

45 minutes

34. The instructor will present information on hearing aids.

15 minutes

35. The instructor will present information on the assessment of communicative awareness and discrimination.

45 minutes

36. The instructor will present information on early communicative comprehension. Each assessment task should be demonstrated by the instructor. Video tapes of children being assessed should be used and reviewed by participants. The instructor should then present information on comprehension and production of questions.

30 minutes

37. The instructor will discuss assessment of caregivers interactive strategies. For expansion of this area use Brown and Bellugi (1964).

20 minutes

38. The instructor will present information on the assessment of early demand/request indication.

40 minutes

39. The instructor will discuss assessment of early semantic usage.

30 minutes

40. The instructor will then present information on the assessment of interactional use of early communicative behavior.

60 minutes

41. The instructor will explain the assessment of verbal production. A practicum should be provided to analyze a small language sample. The instructor will then present information on the assessment of syntactic comprehension.

60 minutes

42. The instructor will present elicitation procedures to assess verbal production, and alternatives to elicited assessment.

10 minutes

43. The instructor will present a summary of critical issues in the formulation of a language intervention methodology. The summary should list the basic assumptions in designing a language training program, which are:

- comprehension precedes production
- cognition hypothesis (are certain cognitive skills necessary but not sufficient for the development of language?)
- relationship between normal and delayed developments (do delayed children follow a normal developmental sequence in their acquisitions of language?)

Distribute Handout No. 5

45 minutes

44. The instructor will present conclusions regarding language intervention for young handicapped children.

30 minutes

46. The instructor will present a summary of Louise Kent's program.

30 minutes

46. The instructor will present summary of Bricker and Bricker's language program.

30 minutes

47. The instructor will present a summary of Guess, Sailor and Baer's language program.

75 minutes

48. The instructor will compare and contrast features of each program. The instructor should compare these programs with MacDonald's program. The instructor should solicit from participants what they would consider in selecting a particular form of augmentative communications.

Cognition, Socialization and Play

15 minutes

49. The instructor will review relevant literature previously covered on early auditory and visual awareness.

60 minutes

50. The instructor will compare the developmental behaviors viewed by Piaget as exemplary of the sensorimotor period of development. The instructor shall define each of the following processes and describe their development through the first two years of life: (use Transparencies Nos. 21-25)
    - means/ends
    - causality
    - imitation
    - space
    - object permanency
    - schemes in relation to objects

    Participants should voluntarily provide examples of each process. The instructor will then relate previously described motor and communicative behavior to the development of sensorimotor skills (particularly means/ends as related to communicative skills). A brief description should be provided of the child's increasing ability to coordinate two separate actions in a simple routine.

30 minutes

51. The instructor will present examples demonstrating that children are most apt to perform old (already in repertoire) actions on new objects and new actions upon old (familiar) objects. The instructor will then introduce the phenomenon of action/object classification (using a pattern of action that is object specific).

20 minutes

52. The instructor will provide a brief description of early social awareness.

15 minutes

53. The instructor will provide a detailed discussion of some of the more frequent actions used with objects. The instructor will introduce functional object use.

20 minutes

54. The instructor will define and provide examples of representational play. Representational play should be compared to other forms of representation including communication and artwork (use Transparency No. 26). The instructor will present information on the emergence of early interpersonal routines including peekaboo, patticake, so big, show, and give, point. The potential influence of these routines upon later recreational

behaviors as well as upon communicative behavior will be discussed.

Participants will be familiarized with terms that refer to distinct progression of interpersonal play skills. These categories of play include: solitary, onlooker, parallel, cooperative routines, and reciprocal routines.

Participants should be divided into dyads. Each dyad should formulate a list of play activities for each category. One number of the dyad should be called upon to present their list of activities.

60 minutes

55. The instructor will briefly review the format of elicited and observational assessment that were presented in the systematic instructions module.

Participants should be asked to generate advantages and disadvantages of each method with respect to play assessment. The instructor should then add any advantages or disadvantages not generated and discuss their importance.

30 minutes

56. The instructor will present information on the variables that must be considered in the assessment of play behavior including: duration of play, variety of toys used, proximity of toys, variety of actions used with individual toys. The instructor will present an observational assessment format designed to capture information referred to above (Transparency No. 27).

60 minutes

57. The instructor will describe and demonstrate the use of the Uzgiris and Hunt Ordinal Scales of Development. Specific discussion of elicited assessment procedures in the areas of means/ends, object permanency, causality motor/verbal imitation and space should be presented.

Participants should be divided into groups of three. In each group, one participant will administer a scale of assessment to another participant while the third participant observes. Participants will rotate within their triad until each participant has administered several assessment scales.

15 minutes

58. The instructor will provide specific levels of play usually included in procedures used to assess representational and make believe play.

Participants should be divided into triads and activities completed similar to those described in participant involvement with the Uzgiris - Hunt scales.

60 minutes

59. The instructor will discuss procedures useful in the stimulation and intervention in the establishment of play behavior using Handout No. 6 as the basis for discussion. The instructor will also discuss Handout No. 7 with participants.

Participants will be divided into groups and asked to practice task analyzing a recreation skill of their choice. Task analyzed recreation material will be presented to the class (this activity is identical

to one conducted during systematic instruction. It should be done here to demonstrate the applicability of task analysis).

Vocational Curriculum

20 minutes

60. The instructor will present a brief background of vocational training attempts for training severely/profoundly handicapped. Handout No. 8 "Vocational Training of the Severely Retarded - Expectations and Potential" should be distributed.

30 minutes

61. The instructor will present an analysis of types of work environments describing advantages and disadvantages of each. The concept of least restrictive environment is applied to the vocational work environment.

30 minutes

62. The instructor will discuss criteria used in selecting relevant vocational skills.

60 minutes

63. The instructor will explain the steps leading to the successful establishment of a vocational program.

60 minutes

64. The instructor will discuss problems encountered in establishing a vocational training program. Emphasis should be placed upon interfacing this discussion with that previously provided during the behavior management module. Handout No. 9 "Behavioral Training Strategies" should be distributed.

90 minutes

65. The instructor will discuss the application of systematic instruction to acquisition and production procedures.

Mark Gold's "Try Another Way" film series should be shown. For information about rental or purchase write Film Productions of Indianapolis, 128 E. 36th Street, Indianapolis, Indiana 46205.

Suggested time for completion of module: 43 hours.

Instructor Materials: Lecture Notes

Toilet Training the Handicapped Child

H. D. Bud Fredericks*
Victor L. Baldwin
David N. Grove
William G. Moore
with contributions by Victoria Furey, Mary Ann Gage,
Elizabeth Jordan, Lynn Levak, Cheryl Riggs and Meredith Wadlow

If children possessed the skills of behavioral scientists, they would report to us that mothers in the United States progress through a series of stages during each of which specific developmental tasks preoccupy their time, thoughts and energies. With considerable certainty they would predict that toilet training would be the preoccupation at sometime for mothers of children whose ages range between 1 1/2 and 4 years. Further observations would suggest that many young mothers follow the toilet training procedures prescribed by their pediatricians. Despite the fact that children are not trained behavioral observers and reporters, it is true that toilet training does become an important topic for their mothers and that for many their major source of information is the pediatrician.

Unfortunately, most mothers of handicapped children, especially mothers of retarded children, have not found the methods which work for normal children helpful. For those mothers the process of toilet training seems agonizingly slow and becomes one of the most frustrating experiences they face. The frustration is exaggerated for parents who previously have raised normal children. They typically find that techniques which were once successful do not work with the same degree of success with their retarded child.

The difficulty of toilet training the retarded child is best illustrated by the time and effort put into the toilet training of retarded children who are institutionalized. In many institutions it is one of the major priorities in training, and unfortunately for many years was the only training provided.

As is the case for most learned tasks, retarded children acquire toilet training more slowly than normal children (Baumeister, 1967), and this is the basis for parent frustration. Consequently, this paper is designed to present to parents and teachers of retarded children a method of toilet training which will provide feelings of success instead of frustration.

Review of the Literature

Probably one of the best early studies on toilet training was conducted by Kimbreel and Luckey (1966) in an institutional setting. In this study they conducted a habit training program for severely and profoundly retarded children. They utilized a technique of training that took the child to the bathroom at specified times in order that the child would learn the habits of toilet training. Another attempt to teach toilet training activities to profoundly retarded patients whose chronological ages varied between eight and fifteen was conducted in 1965 also in an institution (Bensberg, Colwell and Cassel, 1965). Training lasted seven months, utilizing food reinforcers for the first four months. At the conclusion, subjects were generally toilet trained. Baumeister and Klosowski (1965) utilized operant conditioning techniques in an attempt to group toilet train severely retarded children in an institution. At the same time, Hundziak, Mauer and Watson (1965) demonstrated that behavior modification techniques were better than conventional methods in the toilet training of the severely retarded. In addition, they reported that these skills would generalize to living groups from clinical situations.

Many investigators have been concerned with nocturnal bedwetting and various conditioning techniques have been developed to cure this difficult behavior. These are best exemplified by Sloop and Kennedy (1973) where they utilized electrical warning devices with institutionalized retarded. The devices were activated by urine and consequently alerted the trainer and child through a warning

The authors wish to express their professional admiration of Mrs. Phyllis Mix, the first teacher to try this method. She developed the rudiments of the recording form utilized herein. They also wish to thank Dr. James Beaird for his editorial input.
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buzzer. They were successful with eleven of twenty-one people whom they were trying to condition, whereas a control group of a similar size only had one individual show a spontaneous recovery. Unfortunately, follow-up data showed four of the eleven successes relapsed after six months, indicating that maintenance procedures are essential. Azrin, Sneed and Foxx (1974) demonstrated much greater success with 24 eneuretic children (normal intelligence) who with their methods of one all night training session averaged only two bed wettings before achieving 14 consecutive dry nights and had no major relapses.

Perhaps the most recent publication describing a complete program of toilet training has been published by Foxx and Axrin (1973). Their methods require an intensive, total commitment to toilet training.

Rationale for this Program

As was mentioned above, toilet training is a tedious process with the retarded child. Therefore, the goal of this program is to make the process less tedious and to make the most efficient use of the parents' time and effort.

The learning theory on which the program is based, behavior modification, has demonstrated repeatedly that when children are reinforced for a behavior, that behavior is apt to occur again. Reinforcement in this sense means telling the child that s/he did well; it means rewarding the child or giving him/her a sign or signal that indicates that s/he has done a good job. The problem with utilizing reinforcement techniques with toilet training is that the desired behavior (i.e., urination or defecation in the toilet) does not occur, and consequently the parent never has the opportunity to reinforce the child. One solution is to put him/her on the toilet frequently and for long periods of time until s/he does urinate or have a bowel movement, at which time s/he would be reinforced. This process is tedious and time consuming for the parent and is, therefore, rejected as a viable alternative. Instead, our approach operates on the principles of first determining the most probable times when urination and defecation on the toilet might occur and then placing the child on the toilet at those most probable times. In this way the program does not require an all day intensive effort, but only chooses one or two times during the day in which to initially begin the toilet training program. As the child achieves success, this time is extended into other parts of the day. Thus, the object is to reduce frustration by demonstrating success with minimum time expended.

Toilet Training during Waking Hours

The parent is the one who determines when it is time to begin toilet training their retarded child. This time may be comparable to the ages at which normal children are trained, between the ages of 1 1/2 and 4.

This program contains seven basic steps or activities which parents must accomplish in toilet training their child: (1) establishing a baseline record of the child's urination and defecation behavior; (2) using that record to decide the most appropriate times of the day at which to conduct training; (3) selection of reinforcers to use during training; (4) conducting the training; (5) maintaining records during training; (6) expanding training to other periods of the day; and (7) helping the child learn to indicate toileting needs. Each of these steps is discussed below.

Baseline records. The first step is for the parent to complete at least fifteen days of baseline data. This is done on the Toilet Training Recording Form shown in Figure 1. At the top of the form are two blanks for the child's name and the month during which the recording is taking place. Immediately below, across the top, are a series of numbers from 1 to 31 which represent the possible 31 days of the month. Thus, each form is designed to provide toilet training data for one month. On the left hand side of the form are a series of times divided into half hour blocks running from 7 a.m. to 9 p.m. representing waking hours of the child. Thus, the Toilet Training Recording Form allows the trainer to chart the child's behavior by half hour intervals per day.

There are essentially four coding symbols utilized on the form - a zero, a cross, a dot and a triangle (see Figure 1). The zero represents urination, the triangle represents bowel movements, the

cross represents the fact that the child is on the toilet, and the dot represents when the child receives liquids. A zero without a cross means that urination occurred off the toilet; a triangle without a cross means that a bowel movement occurred off the toilet. A zero with a cross or a triangle with a cross means that the elimination occurred on the toilet - the behavior we are trying to achieve. A cross by itself means that the child was placed on the toilet but neither urination nor bowel movement occurred.

Therefore, utilizing the Form, the parent and teacher involved are asked to record daily data on the child for at least a fifteen day period prior to inauguration of a toilet program. This recording is called baseline data. Ideally the parent during this period should check the diapers of the child every half hour. For those parents who find the half hour check too intensive, a check every hour will be sufficient but may well delay the initial success once the training program commences.

Figure 2 shows a chart that has been completed over a fifteen day period. The mother has recorded those times when the child urinated, had a bowel movement, and/or was given liquids. There are naturally no X's recorded on the chart at this time since the child has not been placed on the toilet. The blank boxes on the chart represent those times when the child was dry. In addition, the mother has included information about when the child is napping and when she had her meals. This is optional information but may be helpful when prescribing the program. She has inserted the letter M for a meal and an arrow indicating the nap period.

Choosing training times. Given this baseline information, the parent is now ready to choose those times during the day when toilet training should be provided. Parents should choose *two* periods of the day when the child has most consistently been found to urinate during the baseline period.

In our example (Figure 2) you will notice that Susan was wet every morning from 7 to 7:30 but this is when she awakens and is, therefore, not a good time to choose for training, because we really do not know when the child urinated during the night. The period at 4:30 should be chosen because the child urinated 9 out of the 15 days during that particular time. Likewise, the period at 4:00 should also be selected, because the child urinated 8 of the 15 days at this time.

Name _____ Month _____

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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Coding Symbols:

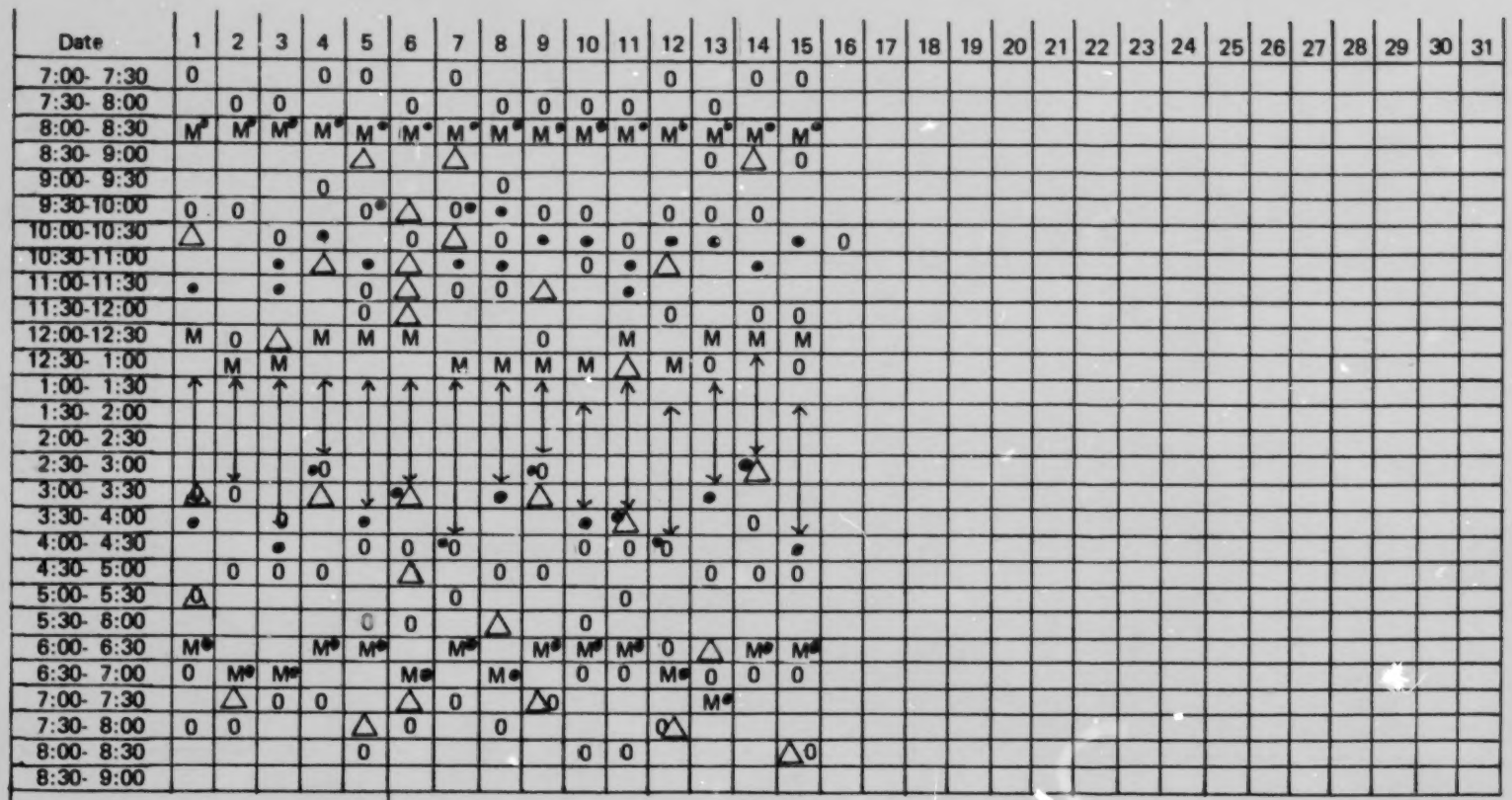
- O = Urination Off Potty
- ⊘ = Urination On Potty
- △ = Bowel Movement Off Potty
- ⊘ = Bowel Movement
- X = On Potty; Nothing
- ● = Liquids Given to Child

Daily Comments:

Figure 1

Toilet Training Recording Form

Name Susan Month March



Coding Symbols:

0 = Urination Off Potty

X = Urination On Potty

△ = Bowel Movement Off Potty

✡ = Bowel Movement

X = On Potty; Nothing

● = Liquids Given to Child

Daily Comments

Figure 2
Baseline Chart

Often, however, baseline data may not be as clear as it appears in Figure 2. Figure 3 shows a child's baseline data where the child is not as consistent as the child shown in Figure 2. In fact, the most frequent urination time is 4 out of 15 days at 3:30. The best alternative available for this parent is to continue collection of another 15 days of baseline and attempt to regulate the time liquids are given. There may also in this particular case be a suspicion that recording is not as conscientious by the parent because of the numerous obvious omissions of data. Notice the lack of entries for any urination for half day period and the lack of liquid entries. In this type of case the extended baseline period with additional data usually provides a clearer picture of the child's performance.

Erratic data such as those shown in Figure 3 are frequently explained by unusual circumstances. Such factors as illness, disruptive family routines, house guests, or visits to other homes may cause data to be quite variable. Certainly the person advising the parent should attempt to determine whether any of those conditions existed during this baseline period. If the time of these unusual circumstances can be isolated, they can be removed from the baseline and the remainder of the baseline data examined for a pattern. However, an additional fifteen days of baseline is the preferred approach in order to produce sufficient data to pick most probable times of success. There is always a tendency to institute a program even though the data are inconsistent, but experience has shown that such a tendency almost invariably results in an unsuccessful program.

Name Al Month April

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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Coding Symbols:

0 = Urination Off Potty

X = Urination On Potty

△ = Bowel Movement Off Potty

⊠ = Bowel Movement

X = On Potty; Nothing

● = Liquids Given to Child

Daily Comments:

Figure 3
Baseline Chart

Choosing reinforcers. Having gathered baseline information, the parent is almost ready to begin the toilet training program for the child. However, another bit of information is necessary in addition to the baseline data —— the determination of what reinforcers will be utilized in the toilet training program. Reinforcers can be anything that the child likes —— playing with a favorite toy, candy, ice cream, being tickled, listening to a favorite record. The reinforcer will vary with each child. Be sure, however, when picking the reinforcer that it is one of the most powerful things for the child. For instance, the child may respond very well to tickling and to praise, but s/he really likes ice cream more than anything else. Ideally, ice cream will be the thing to give the child if s/he has success on the toilet. Whatever the reinforcer, it must be restricted to toilet training only and must not be available during other parts of the day. Many parents are concerned about utilization of reinforcers other than praise, because they believe that they will be giving the child ice cream for as long as s/he is going to the potty, but this is not so. It is not true that we will leave the child with these reinforcers that are artificial or exaggerated for any great length of time. Perhaps an example quoted from a book written by two of the authors of this paper may illustrate the procedure that will be followed with the elimination of these artificial or exaggerated reinforcers (Baldwin, Fredericks and Brodsky, 1972).

"When building a bridge, we have to use enormous supports until the cement dries. The same is true with children. We often have to use exaggerated ADULT REINFORCERS that can work by themselves. Sooner or later we shall have to take the exaggerated support out of our system for we cannot leave the scaffold on the bridge nor can we leave the child in the condition where s/he is dependent upon rewards and goodies for everything s/he does. We have used these exaggerated reinforcers to get behavior started and to become stable. Once this is accomplished, we must pull these exaggerated reinforcers out of the system. If we pull them out too fast, the behavior and the bridge will both lose strength. Children have many more complex qualities than bridges have, so as we begin to withdraw the exaggerated reinforcers from a particular behavior, because it is becoming stable, we can now use the exaggerated reinforcers on a new behavior which we wish to strengthen. We call this withdrawal of the exaggerated reinforcer "fading". In other words, once we get the behavior going, we use only the ADULT REINFORCERS occasionally and we try to let the child develop self-satisfaction out of the job s/he has now learned to do. We save our child's reinforcers for other new behaviors that we decide to teach the child.

"An example may illustrate this last point and how fading works: One of our authors, who was conducting many classes with parents, was met one evening upon returning home by his wife holding the hand of his two-year old son.

"This is your son," she said, "he is not toilet trained. You teach all these parents how to toilet train their children. How about toilet training your own?"

"Our hero, whose alias for this story will be SAM, knowing that his professional reputation was at stake, valiantly approached the task under the critical eye and tongue of his wife. Following the procedures prescribed in our toilet training chapter, Sam first determined when Junior was most likely to "go potty". He then sat him on the potty at that time.

"Sam waited patiently by the door for the tell tale sound of the urine hitting the potty. At last it came—— and with it Sam delivered the reinforcer which he felt Junior would most appreciate.

"First he let out a cheerful, "That-a-boy, Junior" (social reinforcement, exaggerated); then he flashed the bathroom lights on and off rapidly (tangible reinforcement); and finally, because both Sam and his son are part Indian, Sam performed an old tribal war dance with appropriate war whoops. Junior loved it! This ritual was repeated each time Junior went to the potty as he was supposed to.

"Time passed with an increasing number of successes and Junior began to tell Dad that he had to go potty. Sam realized that it was time to begin the fading process. The first thing Sam pulled out of the system was the flashing bathroom lights. The exuberant "That-a-boy, Junior" and the Indian War Dance remained. Gradually, however, the war dance became shorter and less intense, and before long it was only one war whoop. Then the social praise became less enthusiastic, and Sam began to position himself away from the bathroom door where Junior could not see him. Junior then had to say, "I'm done, Dad," and Sam would reply, "Good". Before long, no longer was the "Good" even necessary. Junior was toilet trained and was going "potty" by himself because he knew it was the thing to do.

"Thus, a period of training began with some very exaggerated child reinforcers. As the child demonstrated he could do the behavior, the child reinforcers were gradually reduced and in place were established ADULT REINFORCERS."

Conducting toilet training. And so, after the parent has picked the reinforcer, has the baseline data, and has chosen two times during the day in which to attempt to toilet train the child, the toilet training process is ready to begin. The procedure to be utilized is as described below:

Place the child on the toilet at the designated time for a period of ten minutes. While the child is on the toilet, do not make this a play time or a time to be playing with various objects. If the child has difficulty sitting on the toilet or refuses to do so, this will require a special program and will be discussed under "Special Problems" later in this paper. The parent should be in the room or at the door of the room, listening intently, because if there is a urination or bowel movement, the child should be *immediately* reinforced with the reinforcer that has been chosen. If at the end of ten minutes the child has not performed on the toilet, remove him/her from the toilet without either criticism or praise, put on his/her diaper, and have him/her resume activities for a period of five minutes. At the conclusion of that five minute period, put him/her back on the toilet for a period of five minutes. Again, listen and be prepared to reinforce. Should the child not perform at this time, take the child off again without criticism or praise and return him/her to his/her diaper. After such a sequence the trial has ended and an X is placed on the toilet training chart.

The parents should, during this toilet training time, also record as well as they are able the child's performance during the remaining part of the day. In other words, the toilet training chart should be maintained as it was during the baseline period, because after the child begins to achieve successes at the times designated, other times during the day will be selected; the continual maintenance of the charts allows an easy selection of those times.

Expanding training. Parents now continue to toilet train the child at the two designated times each day. When the child achieves 75% success at either of the two times for a ten day period, an additional time during the day is added for toilet training. (Parents who achieve success rapidly under this method or who are anxious about having the child toilet trained at a more rapid rate than this method espouses, may now pick more than one additional time and may add as many as three or four times. They must understand, however, that this is a major commitment of time - at least ten minutes for each time that they pick and perhaps as long as twenty minutes (i.e., 10 minutes on, 5 minutes off, followed by 5 minutes on). Our experience is that parents frequently do not have this type of time to devote to the toileting training process.) Reinforcers previously determined should be maintained for the additional toilet training period. In fact, it should be emphasized again that the reinforcer be utilized *only* for toilet training, and thus, especially if it is a powerful reinforcer, it will gain even more power in this very important area.

Thus the process continues as the parent gains success during each time in the day - that is 75% success for a ten day period, for each successful period an additional time during the day is added until all periods of the day are covered and the child is achieving 75% success throughout the day in eliminating on the toilet. Ten successive days at this rate is desirable.

Indicating need. After the child achieves a 75% success rate throughout the day, s/he is ready to be taught to indicate his/her need to go to the toilet. This expression of need may well have been occurring prior to this time and if so, this is all well and good; but frequently it is necessary, especially with the more severely retarded child, to teach this as a separate behavior.

The process to use to teach the child to indicate his/her desire to go to the toilet is as follows. The parent is standing near the child when s/he urinates or defecates and says "Oh, Johnny has gone to the toilet!" or "Johnny, has tinkled!" or some other expression which the parent decides is appropriate for the child to use to communicate. We do not specify what is the best phrase or expression, since it seems to be peculiar to each family, and many people who have raised other children utilize the same expression with their handicapped child that they used in the training of the other children.

As the child urinates or defecates, the parent verbalizes this and the child is asked to repeat the phrase. In other words, the parent says, "Johnny is going potty" and the child repeats "Johnny is going potty". If the child is unable to verbalize, a sign or signal should be arranged between the parent and child. We know of one parent who used the signal of "thumbs up", making a fist with the thumb extended up, that indicated that the child went potty. The child was then taught to use that sign. Certainly the standard manual deaf language sign would be appropriate; inserting the thumb in between the index finger and the middle finger and rotating the fist to indicate "toilet" is an acceptable cue.

When the child is repeating the cue of the parent successfully, it is time to have the child answer the "what" question. "What are you doing, Johnny" and Johnny either answers "I am going potty" or he gives the sign or the signal. Once he does this successfully, he should be asked the question prior to going to the bathroom, "What are you going to do, Johnny?" The response to the question is "I am going to the potty."

Of course, each time the child delivers the verbalization or sign correctly, s/he should be reinforced. The goal, of course, is to have the child verbalize when s/he wants to go potty and this should be reinforced when the child does so. Verbalization and requesting to go to the potty is considered to be a behavior separate from the actual behavior of urinating or defecating on the toilet.

Once the child has achieved 85% or 90% during the day, regardless of whether or not s/he is verbalizing the request or desire, night toilet training should begin.

Nighttime Toilet Training

Once the child has achieved 85% or 90% success during the day, it is time to commence nighttime toilet training. The procedures for nighttime toilet training are sometimes even more frustrating for the parents than the daytime procedures. Baseline data should first be taken to determine how many nights the child wets. A ten day baseline period is sufficient. The program consists of four phases.

Phase 1. The first phase of the nighttime toilet training procedure is to insure that the child goes to the bathroom prior to retiring for the evening and to tell the child if s/he is dry during the night that s/he will receive a reward, a surprise, or treat the next day. This is certainly the simplest way to do night toilet training, but this method is not always successful. In those instances when it is successful, it is worth the simple procedure and requires little effort on the part of the parents. This phase should be repeated for ten days. If no difference in the child's performance is noted after ten days, Phase II should be initiated.

Phase II. During this phase reduce the fluid intake of the child for two hours prior to bedtime. Again tell the child that s/he should be dry during the night and again offer the treat, surprise, or reinforcer for the next day. Again, try this for a ten day period. If there is no improvement in the performance of the child, go to Phase III.

Phase III. This phase requires reduction of fluid intake and waking the child to go to the toilet before the parents retire. If the child is dry when the parents wake him/her, they should reinforce him/her. In addition, if s/he urinates upon being taken to the toilet, s/he should receive additional reinforcers. Try this for a period of ten days. If there is no success when the child is awakened or if the child is wet in the morning even though s/he eliminates when awakened, go to Phase IV.

Phase IV. This phase requires a determination of when the child wets at night. If the child is wet when the parents wake him/her in the evening during Phase III, the solution, of course, is to wake him/her earlier in the evening. If the child is still dry and eliminates when awakened but then wets again during the night, the parents must pick a time half way through the night, wake the child and have him/her eliminate. If the child is wet when s/he is awakened half way through the night, the

procedure then is to wake him/her midway between when the parents went to bed and the time that they originally chose to awaken him/her half way through the night.

A couple of examples may suffice to explain this more clearly. Take the case of Jane, who went through the procedure of being told about a reinforcer, reduced her fluid intake, was awakened before the parents' bedtime, but was still wetting during the night. The parents usually retired at 11:00; Jane usually wakened in the morning at 7:00; thus there was an eight hour period of sleep. The parents divided the night in half (four hours), set their alarm at 3:00 and woke Jane at that time. Jane was wet for the first five nights that they awoke her. The parents then decided to awaken Jane at 1:00, half way between 11:00 and 3:00. Awaking her at that time, they found that Jane was dry. If she had been wet, they would have awakened her at 12:00. However, since she was dry they had her go to the bathroom and eliminate. This procedure succeeded in keeping her dry for the entire evening.

Billy's parents and Billy had sleeping hours similar to Jane and her parents. In the case of Billy, however, when the parents awakened him at 3:00, they found that Billy was usually dry. He would eliminate at that time and remain dry for the rest of the night.

Now that a procedure has been found to keep Jane and Billy dry, a procedure must also be established to eliminate the parents getting up in the middle of the night to wake the child. Consequently, in the case of Jane who had to be awakened at 1:00, the parents would awaken her ten minutes earlier each night, keeping track to ensure that she remained dry. In the case of Billy, the parents awakened him half way through the night. The rule of thumb is that if the child is wet half way through the night, then you shape him/her by gradually moving the time that s/he is awakened closer to the time that the child goes to bed. If the child is dry, you gradually move the time closer to the time that the child gets up in the morning.

The important thing about night toilet training, just as with daytime toilet training, is to ensure that there is a powerful reinforcer for being dry. When awakening the child during the night, social reinforcement should be delivered for eliminating or being dry. The promise of additional reinforcers the next day may well accelerate night toilet training. The authors have successfully used such things as stars, special desserts, special time with Mom, playing with a particular toy and television time.

Special Problems

There are a number of special problems which frequently are associated with toilet training. Unfortunately, a paper such as this cannot deal with all the possible problems which arise, but this section will deal with those that are most common.

The "refuse to sit on the toilet" child. One of the most common problems is that of the child who refuses to sit on the toilet. The parents must then teach the child to sit on the toilet before they commence toilet training. The most extreme case, of course, is the child who screams even when brought into the bathroom and placed anywhere near the toilet. In this case, the child should be walked to the door of the bathroom and reinforced at that point. After s/he does that three times in a row without crying, then lead the child about a foot inside the door and reinforce. Again, do this three times in a row, before requiring the child to proceed a foot closer to the toilet. Continue the program in this manner until the child is able to walk to the toilet without crying or tantruming. When the child reaches the toilet, have the child touch the toilet and reinforce. Have the child do this three times in a row without crying. Next have the child sit on the toilet with the top cover down and reinforce. Do this three times in a row. Then have the child sit, fully clothed on the toilet with the top cover up and again reinforce. This behavior also must be performed three times in a row successfully. Finally you are ready to have the child sit on the toilet with his/her pants down, reinforcing him/her for this sitting. Initially let him/her sit for a few seconds, reinforce him/her, and let him/her off. Once s/he is doing this without a fuss, then gradually extend the time in ten to fifteen second increments until the child is capable of sitting on the toilet for a period of at least five minutes without a fuss. When s/he is able to do this, the child is now ready to be toilet trained.

The child who is not "making" it. The second most discouraging special problem is voiced by the parent who says, "I have done everything that you told me, and my child is not making it." At this point we would recommend to the parent, if in fact they have done everything that has been

recommended, that they abort toilet training for a period of about thirty days and then go back to it. They may have to repeat this process a number of times, but they will eventually achieve success. One of the principles that we have learned over the years is that a teacher or a parent, who has used the most powerful reinforcers and has followed a program that has been prescribed for which no further modifications can be made, must not hesitate to abort that teaching program, for they are only keeping the child and themselves in a failure situation which is frustrating to both the teacher or parent and the child. Thus, the temporarily aborted program is a viable alternative in those cases where the teacher has manipulated all the variables, namely the consequences, the cues, and broken the behavior down as much as possible. And the same thing will hold true for toilet training. If the parent has provided the program as specified herein, s/he is providing the most powerful reinforcers known, and is going for a period of 30 days without a success, then it is time to abort the program and take a 30 day break before restarting it again.

The child who reverts. The third most discouraging problem that is frequently seen is that of the child who has essentially been toilet trained but who suddenly starts to revert back to wetting his/her pants and seems to be losing ground instead of gaining it. What has occurred here, more often than not, is that the parent has begun to fade out the reinforcers that they have given to the child for success on the toilet. The solution, of course, is to immediately reinaugurate the reinforcer. Fading it out will have to proceed at a slower pace.

If the reinforcer has still been in existence, but the child has reverted, examine the reinforcer to determine if more powerful reinforcers may not now be required. A child who is given a reinforcer when the toilet training begins is growing and changing and with that growth and with that change other things become more reinforcing for the child. Consequently, the reinforcer needs to be changed. A final point to be investigated is whether the parents are consistently following the program. A toilet training program may span months, and consequently, it is easy to see how parents might gradually become inconsistent in following the prescribed program.

The child who smears. One of the behaviors that we occasionally see in retarded children during toilet training is that of feces smearing either on the wall or on the child's body. No one has been adequately able to explain why children do this. It is extremely disturbing to the parent and to others who happen to come in contact with the behavior. Our recommendation in this particular case is to take baseline on how frequently it occurs. Then punish whenever it does occur. Continue to count it; determine whether or not the frequency of its occurrence is lessening as a result of the punishment. If the frequency is not lessening the punishment is not effective and other punishers may have to be inaugurated. Contrariwise, the parent should reinforce the child for periods when no feces smearing occurs. Let us take the example of the child who smears feces on an average of once a day. The parent may decide to punish him/her by spanking whenever it occurs, but must also reinforce the child every half day with a special treat and a big fuss whenever the feces does not get smeared. Reinforcement combined with the punishment may adequately stop feces smearing.

Summary

We have presented a toilet training procedure for both daytime toilet training and nighttime toilet training and we have discussed some of the more common special problems related to toilet training. In each of these training programs and in dealing with the special problems, we have emphasized the importance of reinforcers for the child. The idea of reinforcing a child for correct toilet training habits is extremely important and cannot be overemphasized, because it becomes the key to success. In only one instance do we recommend punishment, and that is in the case of the child who is smearing feces. It should be emphasized that we are not recommending punishment for failure to eliminate in the toilet.

The procedures described herein are designed to be a simplified method which parents may follow to eliminate most of the frustrations that go with toilet training a retarded child. The procedures do not promise quick results, but they promise steady progress. Quicker results can be obtained if the parent is willing to put further effort into the program. The program described is a minimum effort. Parents may add to it as they wish and may subsequently speed up the process of toilet training.

This program has been tried over a period of seven years with numerous retarded children. Their parents have found it to be a successful method for toilet training their children.

References

Baldwin, V. L., Fredericks, H. D. and Brodsky, G. Isn't it Time He outgrew This? or a Training Program for Parents of Retarded Children; Springfield, Charles C. Thomas, 1972.

Baumeister, A. A. "Learning Abilities of the Mentally Retarded" in Mental Retardation, edited by Alfred A. Baumeister. Chicago, Aldine Publishing Company, 1967.

Baumeister, A. and Klosowski, A. "An attempt to group toilet train severely retarded patients", Mental Retardation, 1965 Vol. 3 No. 6; pp. 24-26.

Bensberg, G. J.; Colwell, C.; Tassel, R. H. "Teaching the profoundly retarded self-help activities by behavior shaping techniques" American Journal of Mental Deficiency, 1965, Vol. 69, No. 5; pp. 674-679.

Foxx, R. M.; Azrin, N. H.; and Sneed, T. J. Champaign, Illinois, Research Press, 1973.

Foxx, R. M.; Azrin, N. H.; and Sneed, T. J.; "Dry bed training: rapid elimination of childhood enuresis", Behavior Research and Therapy, September, 1974.

Hundziak, M.; Maurer, R. and Watson, L. S. Jr.; "Operant Conditioning in Toilet Training of Severely Mentally Retarded Boys", American Journal of Mental Deficiency, 1965, Vol. 70, No. 1; pp. 120-125.

Kimbrell, D. L.; Luckey, R. E.; Barbuto, P. F. P.; Lowe, J. G.; Operation Dry Pants: An Intensive Habit Training Program for Severely and Profoundly Retarded, Abilene, Texas. Abilene State School, 1966 (mimeo).

Sloop, E. W. and Kennedy, W. A. "Institutionalized retarded nocturnal enuretics treated by a conditioning technique", American Journal of Mental Deficiency, May, 1973.

FEEDING ASSESSMENT AND THERAPY FOR THE NEUROLOGICALLY IMPAIRED

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Abstract. This paper is concerned with a therapeutic approach to problems in feeding children with abnormal muscle tone and poor muscle coordination. Feeding therapy is intended to promote normal sensorimotor experience and maximum independence during feeding, as well as to assist in meeting the basic nutritional requirements of the neurologically impaired child. With regard to the goals of therapy, attention is given to means of assessment, intervention, and treatment. The Eating Assessment Tool is presented as an instrument for measuring progress in feeding behaviors.

The following discussion is focused primarily on children with neuromuscular incoordination and abnormal muscle tone. Much of the information could apply to adult rehabilitation and facilitation of normal feeding in mentally retarded individuals. "Feeding therapy" means more than satisfying the basic requirements of nutrition for growth and health. Feeding therapy means promoting normal sensorimotor experiences within the mouth and the entire body during feeding so that maximum independence can be achieved. Many benefits result from this therapy, including: (a) a more pleasurable mealtime experience for child and parent; (b) elimination of health hazards such as choking or inadequate food intake due to swallowing difficulties; (c) improvement in total body coordination by reducing effort involved and reinforcing physical therapy goals; (d) facilitation of speech through improved oral musculature coordination; and (e) a decrease in feeding behaviors unacceptable to the general public.

Therapy goals are not achieved overnight, especially when the abnormal patterns are well-established from years of reinforcement. However, some changes for the better should be observable very quickly if the treatment program is appropriate.

Background Information

The initial feeding assessment should be done by a physical, occupational, or speech therapist with specialized training in neuromuscular disorders. An assessment of the child's overall skills and limitations is usually done first to determine the influence of pathological or primitive reflexes. An understanding of how gravity, posture, effort, and emotions affect muscle tone is important during the assessment and treatment planning. A good resource on this subject is Finnie (1975).

All professionals and parents who provide care for neurologically impaired children should be familiar with some basic principles. Abnormal muscle tone is the primary cause of feeding problems. It interferes with muscle coordination and with tactile and proprioceptive sensation. Proper muscle coordination is dependent upon accurate proprioceptive and tactile information. We have good reason to aim for normal muscle tone during intervention, so that we can break up the abnormal cycle and start building a positive learning experience.

Abnormal muscle tone occurs in different ways, depending on the location and extent of damage to the central nervous system. The abnormal muscle tone may be expressed in the following ways:

1. Hypotonia (floppy, slow or absent righting, equilibrium, and protective responses, affects the entire body);
2. Hypertonia (stiff, may affect all or only part of the body, when behavior is dominated by lower CNS structures early in infant development the only symptoms may be delayed motor development and low muscle tone; as higher centers are activated, and the CNS disorganization becomes more apparent, increased muscle tone occurs); and
3. Fluctuating muscle tone (simplified classification of several types of cerebral palsy requiring a similar treatment approach, muscle tone fluctuates to various degrees of hypotonia and hypertonia).

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Hypertonia occurs in patterns which are influenced by (a) the limb positions in relation to the body, and (b) the body position in relation to gravity. The most important way to inhibit high muscle tone is to avoid the abnormal patterns. The most common patterns in which high muscle tone occurs are as follows:

1. Extensor pattern (extended legs held close together, spine extended, arms pulled back at the shoulders, elbows stuck in flexion or extension, head pushed back; jaw thrust and tongue thrust may also be seen as part of this pattern). Gravity makes this pattern stronger when the child is on his/her back and less strong when s/he is upright or lying on his/her side. Often when this pattern is present, the flexor pattern is also present to some degree.
2. The flexor pattern (legs may be flexed, knees apart, spine flexed, arms flexed, hands fisted, head pulled forward; the bite reflex is part of this pattern but may not be present.) Gravity makes this pattern stronger when the child is prone and has less influence when the child is upright or lying on his/her side. The flexor and extensor patterns are reciprocal so it is important not to try to induce one as an antidote for the other —— neither one is functional.
3. The asymmetrical tonic neck reflex (face is turned to one side, limbs on that side tend to flex, limbs on the other side tend to extend, the back tends toward curvature, especially if the pattern is consistent towards one side).

A discussion of how to avoid these patterns will be included in the section on "intervention." Muscle tone also increases with effort and emotions (stress, excitement). Therefore it is important to be aware of environmental and emotional factors. Self-feeding might be limited to part of the meal if the effort causes an increase in muscle tone which interferes with muscle coordination.

Case Finding

The first step is to recognize a problem. When a child has a long history of abnormal feeding patterns, parents may not be concerned about changing them or they may not realize that any change is possible. Patterns which indicate that a feeding assessment is required are:

1. Choking and coughing more than once or twice during each meal.
2. Inability to keep most food and liquid inside the mouth and swallow it.
3. Tendency to bite down hard on the spoon.
4. Intolerance of solid foods beyond the developmental age of 6 to 9 months (inability to chew, choking, tactile sensitivity).
5. Abnormal sitting posture (i.e., head tilted back or to the side, body tilted laterally, etc.).
6. High muscle tone.
7. Great effort expended by parent or child resulting in unpleasant mealtimes.
8. Persistent tongue thrust beyond the age of 6 months (in and out movement of the tongue); usually goes along with inability to chew, choking, and other findings.

Many children will have several of the above mentioned problems or possibly others interfering with food intake. The next step is assessment.

The Assessment

The best place for the first assessment to take place is in the child's home, with one of his/her parents feeding him/her small portions of a typical meal. In addition, small portions of food which offer a variety of texture, consistency, and temperature can be offered.

The Eating Assessment Tool (E.A.T.) was developed by this author very recently for the purpose of providing a measurement of progress. I attempted to make it simple, yet comprehensive; I have not used it enough to know how much time it will take to score. After the initial assessment has been done in full, and the focus of treatment selected, it might be most useful to use only part of the test to periodically measure progress in a specific area of concern. The instructions and explanations are important for proper use of the tool.

The following comments follow the outline of the Eating Assessment Tool (Appendix A).

I. It is important to observe the child's posture first. Ask if there is more than one way the child is positioned for eating and which way is most typical. If s/he is not sitting upright, estimate the

angle between horizontal and vertical. If the child does not look symmetrical with the head upright, describe. What kind of physical support is provided (under "adaptations")? Comment also in this section on the child's overall muscle tone.

II. When evaluating oral skills, be aware of which body positions trigger pathological patterns. Also notice differences in how foods of various textures are handled together with the relative difficulty of various types of food. It may be difficult to translate your observations of abnormal feeding behavior into the positive scoring method of this test. You may want to write down your observations of abnormal patterns in detail, perhaps including counts of certain behaviors (i.e., choking or bite reflex or jaw thrust) so that you can compare later test observations in these respects. However, it is still advisable to score the test as written so that you can determine its value as a measure of progress. Ask parents about the child's daily dental hygiene and whether they have located a dentist for their child. Note condition of child's teeth and gums. Dilantin, a common seizure medication, causes swollen gums; good oral hygiene becomes even more important to prevent gum tissue and tooth enamel damage. If the child is taking Dilantin medication, the family should be aware of the need for an increased intake of Vitamin D, the dosage levels to be determined by a physician (Pipes, in press).

III. Assessment of eye-hand coordination as well as total postural control will help determine the practicality of teaching self-feeding or on what level this might begin. If the child can bring the hand to the mouth and maintain grasp on an object once it is put in his/her hand, s/he can begin to experience "self-feeding" with long narrow pieces of food such as toast, baby cookies, chicken leg bone (the meat removed gives flavor and teething experience primarily).
Some of the items are subjective and not well-defined; therefore, comments would be especially appropriate. Item number 40 means that most of the food ends up inside the child rather than spread on the table, floor, and clothes. Sticky hands and face are considered acceptable and within my definition of "neat."

IV. Assessment of the feeding behavior and environment will require asking questions of the parents. In addition, however, make your own observations of the emotional tone and interaction pattern between parents and child. Is it stressful? Is mealtime a pleasurable experience for parents and child? Is there any verbal or non-verbal communication and what is the tone? This will require your assuming a non-intrusive role. Ask if the observed behavior is typical or if any differences were perceived.

V. Does the parent perceive problems or desire changes? If not, who does and why? Feeding skills may vary in different situations depending on the excitement level of the environment, the skills of the feeding assistant, hunger, and the anxiety or emotional level of the child.

If the parent does not see the need for change and you do, discuss your concerns and ask permission to start a therapy program without asking for any commitment from the parents until you can convince them that the effort will be worthwhile (this is assuming that you will have daily contact with the child through school). You may want to ask for partial participation, that is, trying your ideas for part of each meal in order to obtain feedback about how successful or non-successful these methods are. When things are not going well at home, another evaluation may be necessary in order to see that instructions are clearly understood and properly used without frustration or discomfort.

The Treatment Plan

Once the assessment is done, how do we determine treatment priorities? The highest priority, it seems to me, should be maintenance of health. This includes reducing incidences of choking and improving quality and quantity of nutritional intake if necessary (see "Foods and Nutrition" section).

The second priority is to improve oral-motor patterns and the third is to promote self-feeding skills. At times the second and third priorities have to be weighed in terms of age, that is, self-feeding may be more important to an older child than chewing without tongue thrust. In these cases one might plan a specific time (all or part of one meal) to work on improving oral-motor patterns and then let the individual self-feed. Adaptations may be helpful in improving self-help skills (to be discussed later).

Keep in mind the normal sequence of motor and oral development so that you work on the more basic skills first. The normal developmental sequence of oral control is: (a) coordination of swallowing and breathing, up and down jaw movements with sucking (tongue moves with jaw), lip closure around nipple during sucking (birth to 2 months); (b) forward and back movement of tongue while sucking (similar to the exaggerated abnormal pattern often seen in older retarded and C.P. persons), the child rejects textures (pushes out of mouth), shows beginning head control, some hands in mouth (2 to 4 months); (c) the child has good head control, opens mouth in anticipation, moves head and mouth towards food, accepts strained, soft foods off spoon without much lip closure, frequently brings fingers and toys to mouth, biting and using tongue to explore (important practice for tongue lateralization to move food in mouth and important for normal sensation) (4 to 6 months); (d) about the time a child learns to sit independently s/he begins to feed him/herself finger food (6 to 10 months; starting with total hand grasp of object such as baby toast or cookie); at first the finger food is mouthed and chewed on (usually before the child has teeth) but does not provide much of the child's nutritional intake. As hand coordination improves, a wider variety of foods can be picked up and put in the mouth. Tongue and lip control are also improving with maturation so that lumps can be introduced with only occasional choking occurring (often associated with too much food in the mouth or a mixture of liquid and solid textures). See Appendix B for an example for transition from first foods to table foods.

The normal developmental sequence cannot always be followed with a handicapped child. Head and trunk control are not necessary prerequisites to chewing or self-feeding, but appropriate adaptations must be provided to compensate for lack of those skills. Nor is the ability to lateralize the tongue a prerequisite for the transition to solid foods; just the experience of having solids stimulating his/her gums (with an adult holding the tongue in place at the back and side of the mouth) will stimulate lateral tongue movement. If a child is unable to get his/her hands or toys to his/her mouth to explore, this type of experience (with assistance) should be a part of his/her pre-feeding program to normalize sensation and stimulate a variety of tongue movements. Recognizing the normal sequence may also be a way to discover a specific gap in a child's development, such as persisting immature tongue movements.

Intervention

Choking, a fairly common problem with severely impaired children, has different causes. The first thing to check is the child's head position in relation to gravity. If food falls to the back of the mouth due to gravity, it is hard to coordinate the breathing-swallowing timing and to control the amount of food ingested with each swallow. (Try eating or drinking while lying on your back.) Secondly, look at the child's head alignment with the body —— if the head is tilted back, the airway is open and food can easily go down the wrong tube (try tilting your head back and swallowing; also remember that mouth to mouth resuscitation is done with the head tilted back in order to keep the airway passage to the lungs open). Certain foods cause more choking than others, such as thin liquids versus thick and foods that require a lot of chewing and don't dissolve in saliva such as raw vegetables, peanuts, and meat (see "Foods and Nutrition" section).

When choking does occur, be sure to get the child's head *down before* hitting his/her back between the shoulder blades so that gravity pulls the food out of the air passage rather than lodging in it more securely. Another method is to hold the individual in front of you, his/her back against your front, your hands clasped over his/her diaphragm and pull in suddenly, forcing reserve air out of the lungs to help dislodge the food (assuming that it's too far down to reach or shake out).

Positioning is one of the most important parts of the intervention program. The upright sitting posture is usually best, but may be modified to a slight backward tilt of the chair with head support, if head control is poor. Cut-out foam cushions may be needed to provide trunk or head support. Adaptations to keep a child from sliding out of his/her chair due to involuntary hip extension include: knee separator, foam wedge under knees, slight (30 degrees to 45 degrees) backward tilt of the chair, peroneal straps around each leg, a seat-belt, a rolled up towel under the knees (tied to prevent slipping). The feet should be supported. If the child tends to pull his/her head and arms back (extension pattern) cushions behind the upper arms to keep the arms forward and a cushion behind

the head should help. Also applying some pressure to the child's chest while bringing the arms forward helps reduce the influence of the extension pattern. Sometimes a wide belt around the child's upper arms and across the chest is useful in keeping the arms forward.

There are many different ways to hold a baby or very young child during feeding. The child might sit side-ways on the adult's lap; if the adult's legs are held slightly apart the child has less tendency to slip off, because his/her hips are more flexed. The arms and head can be controlled with one adult arm and the food presented at midline with the other hand. The problem with this method is the tendency to let the child's head slip back too far in relation to the body and to gravity but that can be easily corrected when one is aware of it. Resting the adult's arm on a table often helps. Other feeding positions are discussed in Finnie (1975).

The child should look symmetrical and aligned for optimal functioning and normal muscle tone. If s/he does not, try to analyze how to change the position.

When the child is floppy, postural muscle tone in the trunk and head can be improved by intermittently giving pressure down through the spine via the child's head and shoulders (be sure s/he is aligned properly).

If the child cannot open and close the jaw voluntarily, or if the jaw opens too widely and sets off other abnormal patterns, jaw control by the adult assistant may be necessary. This is usually done with the index finger and middle finger at the chin if done from the side or back; if the assistant is facing the child, the control is provided with the thumb and bent index finger at the tip of the chin. The only disadvantage with the front approach is the tendency to push the child's head back, out of alignment. See the illustration in Finnie (1975). Often simply correcting abnormal posture can help with jaw control (the tendency to open the jaw too wide with extensor pattern and bite down hard with flexor pattern).

Exaggerated primitive tongue movements (in and out) can be inhibited with jaw control and by placing food to the side of the mouth. At first choose foods you can hang on to while the child chews. Placing food to the side of the mouth also works well with small portions of beginning solid foods such as cheese, crackers, cookies, and vienna sausage. Before feeding or intermittently during feeding, stimulate the side of the tongue by pushing firmly or stroking with a tongue blade (expect movement toward the stimulus). A variety of tongue movements is also stimulated when ice chips are placed in the mouth.

Some older children who have exaggerated tongue and jaw movements when drinking liquid from a cup do better with straw drinking and external jaw control. Straw drinking can be taught by using a flexible tube fitted into a flexible plastic bottle so that pressure on the bottle puts fluid in the tube and assures early success. Be aware of the possibility of increased abnormal tongue thrusting; discontinue use of the straw if the oral patterns deteriorate.

If the child has trouble swallowing food once it is in the mouth, try moving the jaw open and closed and waiting for a response, repeating as necessary. If this technique is not successful, some people feel that stroking under the chin (base of tongue) helps. Generally the stimulus for swallowing is pressure on the tongue from food, so pressing down on the tongue with the spoon just before pulling it out will stimulate swallowing (a technique also used to decrease tongue thrusting). Some people suggest that blowing on the face will promote swallowing.

Lip closure can be stimulated in several ways. Tapping around the outside of the lips is one method of "quick stretch" to the muscle. Rubbing ice around the outside of the lips and on the lips as long as tolerated (about 20 seconds; avoid discomfort, watch for clues) before a meal will also stimulate lip closure, Battery operated vibrators are also used. Some people have suggested using lemons or pickles to promote the pucker.

Chewing can be facilitated by helping the up and down jaw movement get started, but never try to facilitate the rotary component of chewing. It's much too subtle and will develop spontaneously when tongue lateralization during chewing is developed. The stimulus of pressure of food on the teeth is the key to the chewing response. Jaw closure can also be stimulated by tapping on the chin.

The rejection of solid foods by the child may be based on primitive protective responses. Very often tactile and proprioceptive sensation is impaired (remember how difficult it is to chew after novocaine?) but can be remedied through graded application of stimulation to the inside of the mouth. Rubbing your finger firmly on the child's gums twice from midline to the back of both sides,

top and bottom, allowing time to swallow between each stimulus is a helpful pre-feeding exercise.

An example of gradual transition from mushy foods to solids is seen in Appendix B. It is usually best to introduce new foods and textures in small quantities at the beginning of a meal before offering the easily accepted foods, gradually increasing the amount and variety of new foods. This is *not* going to work with all children. Some children seem to do better with total elimination of "baby" foods when soft solids are first introduced. If a child seems to have a hyperactive gag reflex (stimulation on the front part of the tongue produces a gag response which is supposed to occur only with stimulation way back on the tongue) start reducing the sensitivity by touching firmly with a tongue depressor on the lips, then tip of tongue, slowly working back further on the tongue as it is tolerated, over a period of time. Flexing the head forward as the child starts to gag will usually stop the response. Behavior modification is also often necessary because the gag response usually has elicited a lot of attention from others in the past.

Drooling can be a result of lack of lip closure or jaw closure, poor sucking, low tactile sensation, or mouth breathing. Finnie (1975) suggests that firm pressure between the nose and upper lip be applied periodically throughout the day in order to stimulate mouth closure. Sucking on popsicles or ice chips will improve sensation and the use of tongue and lips. Tapping on the chin or cheeks will facilitate jaw closure. Frequent use of straws may also help. You might also have the child practice breathing through the nose for short periods of time and increase the length of time. Behavior modification procedures are also very helpful in promoting change. Learning to hum songs may be helpful for the child.

If the child tends to push his/her head back, it is helpful to approach him/her slowly with the spoon or food and stop short of his/her mouth, encouraging head movement forward to get the food off the spoon. Try not to lift the handle of the spoon up when pulling it out —— rather pull it straight out. Drinking from a cup with a space cut out of the rim at the top as described in Finnie (1975) or drinking with a straw will eliminate the necessity of tilting the head back. A straw that fits inside a baby bottle nipple can be used for babies so that they can sit with head slightly forward holding the bottle down instead of propped up.

Self-feeding can be initiated as soon as the child can handle food in the mouth with normal muscle tone. Interest in food is an important motivational factor. The adult can assist the child by holding his/her hand or elbow as necessary, withdrawing assistance as the child is able to take over. This can occur for part or all of the meal. If the child has difficulty with voluntary grasp and release, a bread stick or other long, thin food can be placed into his/her hand. Children often are able to bring a spoon with food to the mouth before they are able to load food onto the spoon so the adult can assist with that. A variety of adaptations can be made or purchased including spoon handles, rimmed plates, non-slip placemats, and a wide variety of cups. The bowl of the spoon should fit into the child's mouth easily. Curved handles are helpful to some children and are designed to be used with only the left or the right hand, depending on the direction of the curve. A simple sandwich holder using a rubber band for tension can make it possible for a child to take several bites before the sandwich needs to be relocated if his/her own grasp might squeeze the sandwich too hard.

Parent participation is very important; they should be encouraged to share their ideas and observations in a problem-solving team approach. The basic principles affecting muscle tone should be taught at the beginning, so that parents can readily assess which positions and approaches work best for their child. Many of my ideas come from parents who have tried a variety of approaches to see what works best. It is a good idea for everyone involved in feeding the child to use basically the same approach and expectations. Periodically these people should be questioned about how they feel things are going; difficulties can then be corrected early. A solution may be as easy as finding a more comfortable position for the adult, or adding support for the child's posture.

Foods and Nutrition

The parents should list foods that the child likes, dislikes, or has difficulty with. Start therapy with foods the child likes, then introduce new foods, perhaps alternating them. In general, the following guidelines are offered:

Liquids are easier to handle when thickened (buttermilk, thinned yogurt, thinned apple sauce or

pudding, milkshakes, gelatin or instant pudding added to liquids for thickening purposes).

Multi-textures such as vegetable soup, apples, watermelon, and grapes that involve handling thin liquid and a solid are most difficult. Also foods that don't dissolve such as raw vegetables, peanuts, popcorn, and meat are most difficult.

Taste, temperature (warm or cold vs. room temperature), and texture stimulate chewing and swallowing. Foods with a crunchy quality that dissolve fairly easily, such as crackers, cookies, breadsticks, dry cereal, and toast strips, give good sensory stimulation and are safe. Other beginning finger foods include: fruit leather, beef jerky, meat cut with the grain in strips, licorice sticks, cheese sticks, and popsicles. Many children enjoy holding a chicken, turkey, or beef bone and gnawing at it.

Many neurologically handicapped children start slowing down in growth rate by 2 years of age (Pipes, in press). This usually has nothing to do with their adequacy of nutrient intake, but rather seems to be related to the neurological damage. If the child's height and weight correspond roughly on the growth grid charts, then there is usually no reason to worry.

There are many questions that arise that only a nutritionist can answer. The areas of concern include: (a) marked discrepancy in height and weight (fat or skinny); (b) limited variety of food intake; (c) unusual family diet; (d) need for supplemental vitamin D when taking Dilatin seizure medication; and (e) restricted diet due to allergies. Other guidelines are listed in Erickson (1976; Chapter 9).

Summary

Feeding therapy promotes normal sensorimotor experience within the mouth and the entire body during feeding so that maximum independence can be eventually achieved. An understanding of how gravity, posture, effort, and emotions affect muscle tone is important during the assessment and treatment planning. Positioning is one of the most important parts of the intervention program, due to the effect this has on muscle tone. The attitude of the child's assistant must be relaxed and friendly and calm to avoid hypertonus related to emotions. The feeding environment should also be assessed in relation to the child's needs. Attention should be directed toward developing normal oral-motor patterns before encouraging self-feeding. The effort of self-feeding often increases muscle tone initially, making oral control less coordinated. More success is likely when the individual has had experience with normal oral-motor sensation.

Feeding therapy is intended to complement and provide carryover from regularly scheduled physical therapy and occupational therapy. A treatment plan should be based on input from every person who feeds the child, especially parents, and then carried out fairly consistently, with attention to changes in the child's skills which will indicate need for program change. A positive approach is advocated in which the child is praised for his/her accomplishments (often enough to make him/her feel good and to recognize his/her efforts, not so much that it loses its meaning). Breaking tasks down into small steps makes it possible to measure changes more readily in severely handicapped children. The Eating Assessment Tool is designed to measure change while looking for normal developmental skills. Abnormal patterns can be described in the comments section, but are not considered in the score.

Eating Assessment Tool (E.A.T.)

Revised 4-77, Pilot Project
Paula Schmidt, OTR

Rating scale based on direct observation.
Bracket ( ) scores when adaptation or assistance used;
score without assistance outside brackets.

1 = 0-10% seldom
2 = 10-50% occasionally
3 = 50-90% frequently
4 = 90-100% almost always
N.O. = not observed

Name
B.D.
Age
Diag.
Ther.

I. Gross Motor Skills, Posture During Feeding

1. Sits on standard chair of appropriate size
2. Symmetrical sitting posture
3. Upright trunk
4. Upright head
5. Stays in chair without slipping
6. Feet supported

Comment, description:

II. Oral Skills

7. Absence of drooling when not eating
8. Mouth closed when not eating, talking
9. Brings head forward to food held in front of mouth
10. Opens jaw only as much as necessary
11. Keeps tongue in mouth when food inserted
12. Tolerates tactile stimulation outside mouth without indication of discomfort
13. Tolerates tactile stimulation inside mouth without indication of discomfort (note condition of gums and teeth).
14. Takes food into mouth from spoon
15. Cleans spoon with lips;
    a. upper lip
    b. both
16. Lips closed while chewing
17. Lips closed while swallowing
18. Food stays in mouth
19. Drinks from cup without tongue thrust
20. Can drink from straw
21. Liquid stays in mouth
22. Bites off food without increasing muscle tone other parts of body
23. Moves jaws up and down in chewing pattern
24. Chews without tongue thrust
25. Lateralizes tongue to keep food between teeth while chewing
26. Takes liquids without resistance
27. Swallows liquids without choking
28. Swallows solids without choking
29. Cleans food off lips with lips and tongue
30. Takes food from spoon without biting spoon

Comments, description:

III. Eye-Hand Coordination

31. Brings hand to mouth spontaneously
32. Able to suck on fingers
33. Picks up object from hard surface (provide four opportunities)
34. Maintains grasp of object
35. Volitional release of grasp (not throwing) based on four requests to put something on table surface
36. Brings objects to mouth (four opportunities)
37. Holds food while sucking, chewing on it (i.e., teething biscuit——stage before purposeful self-feeding)
38. Attempts to assist when being fed (reaches for food, spoon)
39. Self-feeds finger food
40. Places appropriate amount of food in mouth
41. Picks up spoon, holds in functional position
42. Brings spoon with food to mouth
43. Scoops food onto spoon
44. Complete self spoon feeding

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45. Self spoon feeding, neat
46. Holds bottle or cup while drinking
47. Independent cup drinking, seldom spills

Comments, description:

IV. **Feeding Behavior**

48. Interest in eating
49. Cooperation in eating
50. Attends to task, not easily distracted
51. Consumes variety of food, most foods acceptable
52. Appropriate social behavior
53. Normal muscle tone with approach of food
    a. without distractors, other people
    b. with other people, some distractors

Comments, description:

V. **Other (to be answered)**

1. Evaluator perceives needs for intervention
2. Parents involved in changing child's feeding skills (or whomever child lives with)
3. Teacher involved in changing child's feeding skills
4. Regularly scheduled mealtimes
5. Weight recorded periodically. How often?
6. Height recorded periodically. How often?
7. Was behavior at this meal typical? If not, note discrepancies
8. Length of time to finish this meal
9. Describe food (pureed, ground, chopped, bite-size, whole)
10. Food allergies
11. Food dislikes (color, temperature, texture)
12. Medication or food supplements taken at mealtime
13. Foods difficult to eat
14. Usual mealtime procedure (i.e., liquids last or interspersed, how much independence expected; information that would be helpful to new feeding assistant)

Comments, description:

E.A.T. Instructions

The individual items on this assessment tool are worded in a positive way, so that a high score is the ultimate goal. A low score should be interpreted as a possible indicator of the necessity of providing remedial therapy, though the score of a very young child would have to be considered in view of appropriate expectations. If you are not sure how to score an item, consider whether you feel intervention is necessary for that item (e.g., item 10, jaw opening slightly more than necessary is not a problem worthy of intervention, but extreme variance from normal would be). Item 36, toy to mouth, would be scored N.O. if not observed and developmentally inappropriate.

Read over the items before the feeding session. Try to fill out the form during the feeding time or immediately after. Score the items as if you are seeing the client for the first time (comments may be inserted for your records). Bracket scores ( ) when adaptations or assistance is necessary so that subsequent evaluations would reflect changes in the level of independence, preferably including scores outside brackets, indicating function without adaptation or assistance. Describe necessary assistance and equipment as desired for client's record.

You will need the following items during the assessment:

1. A standard spoon
2. A plastic straw
3. A cookie or cracker if client is on a soft diet
4. A cup and liquid
5. A rubber toy to chew if developmentally appropriate. (Present before food.)

This evaluation tool is in the process of being analyzed for revisions. Comments and suggestions may be sent to Paula Schmidt, OTR, Child Development and Mental Retardation Center, University of Washington, WJ-10, Seattle, Washington, 98105.

Analysis of Food Manageability;
Comments on Nutrition

It is often helpful for the therapist to practice eating different kinds of food while imitating the specific problems experienced by the child. As new foods are introduced, carefully observe the child's response (use of oral patterns).

A. Liquids are easier to handle when cold or warmed and when thickened (more sensory feedback). Examples: buttermilk, eggnog, thinned yogurt, apricot nectar, milkshakes. Cornstarch, tapioca or unflavored gelatin can be used as a thickener.

B. Solids

1. Beginning finger foods should dissolve in the mouth after two or three chews. A crunchy quality gives good sensory stimulation. Examples: Breadsticks, soda crackers, dry cereal, toast strips, cheese sticks, Vienna sausage.
2. More advanced finger foods require more chewing. Example: sandwiches, raisins, hot dogs.
3. Chewable foods which break apart into firm, diffuse pieces are more difficult than foods which maintain a more solid single mass. Thus hamburger may be more difficult than chicken or roast beef which mat together when chewed.
4. Most difficult foods are those that don't dissolve when chewed and which require extensive chewing, such as popcorn, nuts, raw vegetables, and meat (especially steak).

C. Multi-textures that involve handling a solid and a liquid can be difficult for a child with a lack of coordination of oral musculature. Examples: watermelon, vegetable soup, grapes (skin needs to be chewed while liquid is either retained or swallowed).

D. Food Preparation

1. Taste and temperature stimulate chewing and swallowing. Children often like spaghetti, possibly because it is flavorful and colorful. Check temperature on your wrist to see if it is too hot.
2. Gradation of difficulty: liquid —— strained —— mashed —— chopped —— bite-size —— regular table foods —— foods requiring extensive chewing. Start the meal, when motivation and energy level is greatest with more advanced expectations (i.e., foods to be chewed before soft foods).

E. Nutrition

1. Neurologically impaired children tend to be smaller in height and weight than "normal" children of the same age. Records of height and weight should be maintained in order to identify discrepancies in percentile which would indicate whether child is over or under weight.**
2. Children with limited energy output may have a tendency to become obese. This would further inhibit movement and energy output. Children with spasticity, athetosis or hyperactive behavior tend to have higher than normal caloric needs due to greater energy expenditure.**
3. Whole milk and whole milk products can be allergenic and/or mucous-thickening. Substitute with powdered milk, skim milk, and skim milk products (cottage cheese, yogurt).*
4. Many children with cerebral palsy have inadequate iron intake. Foods with iron include cooked cream of wheat, dried fruits such as apricots, prunes, peaches, raisins.*
5. Many lunch meats and hot dogs are good for initial stages of chewing, but avoid frequent use due to high levels of chemical preservatives.*
6. If a child must eat strained foods, suggest use of a food grinder or blender in order to use the same foods given to the rest of the family. This practice will be more economical for the family and healthful for the child. When commercial baby foods are used, select the straight meats and straight vegetables and mix them yourself so that the meat content is higher than in the pre-mixed bottles.*

7. If the child needs to have soft foods thickened, untoasted wheat germ is more nutritious than potato flakes or baby cereals. A young infant may not be digestively mature enough for wheat, so rice cereal or powdered milk could be used.*
8. Sweet foods and drinks tend to create saliva and reduce appetite for more nutritious foods.*
9. Children who are on anti-convulsant medication tend to poorly metabolize vitamin D and therefore need extra amounts. Ask your physician or nutritionist for advice.**

In Summary

The feeding therapist should set a good example for the child and his/her parents by the foods suggested and used in the feeding program.

** Suggestions from Suzanne Evans Morris, Ph.D., Speech Pathologist.*
*** Suggestions from Peggy Pipes, M.S., Nutritionist. (See references)*

References

Barnard, K., & Powell, M. Teaching the child with developmental problems: A family care approach. St. Louis: C. V. Mosby, 1976.

Bosma, J. F., (Ed.) Fourth symposium on oral sensation and perception. Fogarty International Proceedings. (Very technical.)

Bowman, M., Calkin, A., & Grant, P. Eating with a spoon, how to teach your handicapped child. NCEMMH Reprint Series, Publ. 4NL-75.906 Columbus: Ohio State University Press, no date.

Britian, L. A. Developmental stimulation guidelines for special children, birth to three years. Mission, Kansas: Infant Development Center, 1974.

Children's Bureau Publications. Feeding the child with a handicap, author unknown? U. S. Government Printing Office: Washington, D. C., 1967.

Children's Bureau Publications. Feeding mentally retarded children. author unknown, U. S. Government Printing Office: Washington, D. C., 1967.

Erickson, M. Management of developmental changes in children. St. Louis: C. V. Mosby, 1976.

Harvey, M. A., (Ed.) Feeding the handicapped child. Distributed by: Department of Nutrition, CDC, University of Tennessee: Memphis, no date.

Holser-Buehler, P. The Blanchard method of feeding the cerebral palsied. American Journal of Occupational Therapy, 1976, 20, 1.

Holser-Buehler, P. Correction of infantile feeding habits. American Journal of Occupational Therapy. 1973, 26, 6.

Leibowitz, J. M., & Holser, P. Building and maintaining self-feeding skills in a retarded child. American Journal of Occupational Therapy, 1973, 28, 9.

Mann, W., & Sobsey, R. Feeding program for the institutionalized mentally retarded. American Journal of Occupational Therapy. 1975, 29, 8.

Mueller, H. Feeding. Chapter 9 in N. Finnie, Handling the young cerebral palsied child at home. New York: E. P. Dutton, 1975.

Peiper, A. The neurology of food intake, chapter 9, Cerebral function in infancy and children. New York: Consultants Bureau, 1963, (Technical, detailed).

Pipes, P. M. Nutrition in infancy and childhood. St. Louis: C. V. Mosby, 1977, (highly recommended).

Schmidt, P. Feeding assessment and therapy for the neurologically impaired. American Association for the Education of the Severely and Profoundly Handicapped Review, 1976, 1, 8.

Stainback, S., Stainback, W., Healy, H., & Healy, J. Teaching basic eating skills. American Association for the Education of the Severely and Profoundly Handicapped Review, 1976, 1, 7.

Overview: The Study of Communication in Children

This section addresses the topics of: 1) the sequence in which normal children develop communication and early language skills, 2) the methods used to assess communication and early language and 3) some of the current methodology and content used in stimulating and training early communicative skills.

Definitions of Language and Communications

Language- A language is the standardized system used by an individual to express and understand communicative intents, meanings, and combinations of meanings. A language may involve a variety of response modalities (signing, writing, verbalizing). To be a language, however, it must be mutually agreed upon by those using it.
Production- The act of purposely encoding a message directed to another individual.
Comprehension- The understanding of a symbol or group of symbols without the aid of any related motor or environmental cues.
Communication- The study of communication entails the observation of a speaker encoding a communicative intent and a listener responding or acknowledging the expression of that intent. Communication for the developmentally young involves an interaction of motor, social and cognitive skills. Communication is the interpersonal use of both production and comprehension within any given interactive sequence.
Awareness- The recognition of an environmental change or change in the status of a fellow communicator.
Communicative intent- The overt display of motor, vocal, or motor and vocal behavior that was specifically produced for the benefit of another party. (e.g., if I scream and point to my crotch- my communicative intent is to demand/request permission to go to the bathroom.) With some overt behaviors (e.g., crying) it is often difficult to discern whether the crying is for the purpose of getting another's attention (communicative intent) or is done reflexively (noncommunicative) and is not necessarily intended for anyone else's benefit.

Components of a Language

Syntax- The ordered relationship between words.
Semantics- The relationship between signs, or symbols and their meansings, and of their influence on human behavior.
Phonology- The study of speech sounds.

I. A brief review of communicative awareness
   A. Response to differential auditory stimuli
      1. Effects of stimulus intensity
         There is a substantial volume of evidence suggesting that as a child progresses from birth through the first year of life, responsiveness is obtained with decreased intensity of the auditory stimulus.
         a. newborn - three months
            aroused from sleep by sounds 90dB(spl) in a noisy environment.
            aroused from sleep by sounds 50-70dB(spl) in a quiet environment.
         b. three - four months
            overt response to sound occurs at 50-60dB(spl).
         c. four – seven months
            responds to sound that is 40-50dB(spl)
         d. seven – nine months
            responds to sound that is 30-40dB(spl)

** With some overt behaviors (e.g., crying) it is often difficult to discern whether the crying is for the purpose of getting another's attention (communicative intent) or is done reflexively (noncommunicative) and is not necessarily intended for anyone else's benefit.*

e. nine - twenty-four months
responds to sound that is presented at 25dB(spl)

After the twentieth week of gestation the ear has normal adult functioning. The fact that the child's hearing appears to get better with age is probably due to the fact that s/he becomes more observant of his/her environment.

2. Effects of stimulus frequency
   a. most newborns (if not all) can discriminate sound on the basis of frequency.
   b. low frequencies tend to have a soothing or inhibiting effect on the infant.
   c. high frequencies have the propensity to prompt distress.
   d. stimulus presentations below 4000tlz are two or three times more response provoking than those in very high ranges.
3. Effects of infant state upon presentation of auditory stimulus
   a. "The magnitude of the child's response change is influenced by the state of the individual before stimulation" in such a way that the lower the pre state prior to stimulus presentation the greater the increase in level of activity and
   b. the more alert the child is prior to stimulus presentation the greater the decrease in level of activity. Eisenberg (1976)
4. Types of responses emitted by child upon presentation of auditory stimulus.
   a. arousal - newborn
   b. orienting behavior
      (1) Turning head:
      lateral localization (3-4 months)
      downward localization (7-9 months)
      localizes upward (13-16 months)
      localizes any angle (21-24 months)
   c. wide-eyed expression
   d. pupillary dilation
   e. motor reflexes
      facial grimaces
      body movement
   f. crying

B. Response to early social auditory stimuli (0-3 months).

The growing ability of response elicitation through the use of more subtle auditory cues is exhibited by the infant's responsiveness to a human voice.

1. Between one and three months of age children have been observed to respond differentially to friendly vs. hostile voices.
2. Additionally one to three month olds have been observed to differentiate between inflection and noninflection.
3. Verbal stimulus has been demonstrated to be an effective reinforcer of infant vocalizations.
4. Female infants detect the difference between mother's speech when child is the object of speech vs. when someone else is the object of mother's speech.

C. Response to early visual stimuli (0-3 months).
1. If child smiles and mother responds with a nonmatching gesture the child is apt to either: (1) imitate or (2) stop motor actions and show distress.
2. The child approaches a dangling object.
3. Child is more apt to fixate on a doll having a face than on a doll not having a face.
4. Smiling to a facial stimulus increases rapidly peaking at around 13 weeks of age.

D. Response to visual stimuli (4-8 months).
1. Infant follows adult's line of regard (e.g., when adult turns away to look in another direction, child will do so too, even though there was no overt stimulus cue coming from the new area of focus.)
2. Child reaches toward objects of notice.
3. Child interacts with inanimate objects in same fashion as animate objects.
4. Infant initiates motor responses but occasionally glances at adult in order to obtain feedback.

E. Early motor responses (4-10 months).
   1. Child holds hand toward object in non-grasping directional gesture. 4 months
   2. Child touches people (actively seeks out human contact). 4-9 months
   3. Child uses adults to obtain objects. 8-10 months
      (cross reference: means-ends in social and play module)
   4. Child uses objects as a means of obtaining adult attention. 8-10 months
      At this point it should be established that Bates (1976) refers to items 3C and 4D as early examples of declaring and demanding when paired with vocal behavior. This phenomenon is often cited as occurring during Piagetian sensorimotor stage 5. This phenomenon also tends to mark the first clear indication of communicatively intentful speech. This will be addressed in detail later in module.
   5. Child shows off and repeats behaviors that have previously been successful in provoking responses. 8-10 months
   6. Child may begin to interact with others in task reciprocal but now identical roles (e.g., mother throws ball, child throws ball in hoop - rebounds ball and throws to mother). 8-10 months
   7. Child orients toward an interesting event or object - points to the object, swings around points to adult and then shifts point back to object. These actions are undertaken in an effort to obtain the adult's attention. 13 months

II. Situational understanding vs. the understanding of words
   A. Communicative behavior of others.
      There is a growing literature describing the child's response to the verbal behavior exhibited by others. Only recently have investigators and clinicians gone about formulating ways to determine the processes used by the child in his/her earliest attempts at comprehension. It is possible that the child comprehends on the basis of contextual cues in the environment rather than linguistic comprehension of the words uttered by his/her speaking partner. The nonlinguistic means of comprehension will constitute the first topic of discussion in the description of the child's early response to communicative behavior exhibited by others.
   B. The establishment of early understanding
      First attempts at semantic comprehension. Frequently children use cues within the environment to the extent that it may appear that they understand words that they actually do not. Early "contextual comprehension" has been reported as early as eight months of age. The cues that children use to give the appearance of comprehension have been grouped into a series of comprehension strategies. These strategies include:
      1. *Look at objects adult looks at.* The adult looks at object(s) that s/he is talking about. The child may look at the object being talked about giving the appearance that the child understood what the adult said. It is entirely possible, however, that the child simply attended to the adult's visual cueing.
      2. *Act on objects noticed.* The child receives a demand to retrieve an object. If there is only one object in the room, the child will act on that object whether or not s/he comprehended the meaning of the adult utterance.
      3. *Imitate the activity initiated by the adult.* The adult knowingly or unknowingly models the activity that s/he has demanded the child to perform. e.g., "Tommy stand up" (as the adult him or herself stands up). The child may readily imitate the adult's action without comprehending the spoken command that accompanied the visual cue.
      4. *Attend to object mentioned/do what you usually do.* After the child has acquired a limited vocabulary, the adult may demand the child to perform an action associated with an object. The child may appear to comprehend by performing the appropriate action simply because s/he recognized the object name, located the object and then did what s/he usually does with that object.
      5. *Probable location.* After the child has acquired a limited vocabulary, the adult may demand the child to find an object in "such and such" a location. The child recognizing the object name may simply go to the location where the object is normally kept and retrieve it without understanding the locative term.

6. *Probable event.* The adult may give the child an object accompanied by a demand for an action upon the object. The child may perform the appropriate action based on the rules: do as you usually do given a particular object in a particular situation, e.g., given an apple while seated in a highchair, the common action is to take a bite out of it.

It is difficult to determine the point at which young children begin to more frequently utilize linguistic meanings since mothers frequently cue motorically between 85 and 100 percent of their verbal utterances directed to children.

* It is generally agreed that children begin to emit behavioral compliance with some non-motor cued commands as early as twelve months.
* Comprehension is demonstrated by appropriate answers to questions as early as twenty-four months.
* Children will point to pictures of words comprehended as early as eighteen months.
* Around twenty months of age children will manipulate objects in accordance with adult demands and requests.

C. First attempts at linguistic comprehension
   1. Child comprehends name. (9 months)
   2. Child gives "some" response to a verbal request. (9 months)
   3. Child recognizes several words in addition to familiar environmental sounds. (9-12 months)
   4. Child responds appropriately to "no-no" when it is not motor cued. (12 months)
   5. Child indicates recognition of an association between an acoustic event and an object by a shift in gaze toward the object or an arrest in attention.
   6. Child is able to focus on key words in order to carry out simple non-motor cued commands. (18 months)
   7. Child identifies picture by the action represented. (18-20 months)
   8. Child masters "in, on, under" in comprehension (21-35 months)
   9. Child masters "yes/no" comprehension. (24-30 months)
   10. Child masters "what, what do, where (direction), where (place)" comprehension. (30-36 months)
   11. Child masters comprehension of front/back/side in the following sequence
      a. Child places object in front and back of self.
      b. Child touches front and back of fronted object.
      c. Child places objects in front or back of fronted objects.
   12. Child comprehends "how many, why, who". (3-5 years)

III. Early vocal behavior
   A. Spontaneous
      1. Contrary to principles of operant conditioning, reinforcement of crying behavior does not result in more crying (1-3 months)
      2. Vocal contagion-child exhibits a greater propensity to vocalize if there is social behavior occurring in his/her presence (where others are vocalizing the child is more apt to vocalize).
      3. Differentiated cries
      4. Syllabic babbling
   B. Continuations
      1. Mutual imitation (4-6 months)

child vocalizes → imitation by another → child imitates

      2. Increased frequency of output by using a variety of reinforcers (3-6 months)
         a. social praise
         b. visual presence of human but no verbal contingent praise
         c. nonhuman auditory reinforcement
         d. edible reinforcement

It has been demonstrated that the most effective reinforcing consequence of infant vocalization is a combination of a, b, c, and d.

C. Responses
   1. Spontaneous initiation
      a. adult produces sound in child's repertoire → child imitates
      b. adult produces sound not in child's repertoire → child imitates

D. Initiations and/or responses
   1. Sensorimotor morphemes - expression of communicative intent through utilization of motor behavior.
   2. Performatives - expression of communicative intent through utilization of gesture and vocalization or word.
      Hi/bye routines
      Comment request for object or attention

IV. Production of semantic functions
   A. Relational semantic functions
      1. recurrance - a single word utterance used to request or comment upon the reappearance of person, event or object that has been displaced. e.g.,/more/
      2. nonexistance - a single word utterance used to indicate that the presence of an object, person or event was expected. e.g., /no/
      3. disappearance - a single word utterance used to indicate the fact that a person, object or event was in existance in an immediately preceding context. e.g., /away/ /all gone/
      4. rejection - a single word utterance used to indicate/demand a disassociation with a person, object or event. e.g., /no/
      5. cessation - a single word utterance used to indicate/demand the discontinuence of an ongoing action or event. e.g., /no/
      6. existance - a single word utterance used to acknowledge the presence of people or objects. e.g., /uh oh/
   B. Substantive semantic functions
      1. vocatives - a single word utterance used to call for someone. e.g., /Mommy/
      2. agent - a single word utterance descriptive of the perpetrator of an action.
      3. object - a single word utterance descriptive of the person or thing that the agent acted upon.
      4. action - a single word description of the force or movement accomplished as the result of an agent.
      5. possession - a single word description of alienable belongingness.
   C. Child usage characteristics of single word utterances between 12-18 months.
      1. function words
         relatively few different function words are in the repertoire of the child.
         those few words, however, are used frequently.
         once a function word enters the child's repertoire, it tends to be maintained.
      2. substantives
         once substantive words are acquired the child continues to maintain them in his/her comprehension vocabulary.
         substantive words tend to drop out of the child's productive vocabulary subsequent to their original acquisition.
      3. names
         the names of persons, objects and actions demonstrate the same characteristics as the substantive words.
         the child tends to more frequently name objects that s/he uses or acts upon or moves or changes. (for example: the child is less likely to learn the names of furniture as furniture is not movable and is not directly manipulated by the child.)
   D. Errors made in the productive use of single word utterances
      1. unsystematic overinclusion - the use of one word for several referents loosely

associated by the child but unsystematic in the adult's eyes. e.g., the child classes duck and cow together because they both walk.

2. systematic overinclusion - consistent use of one verbal referent to describe an object that does not fit the referent class (e.g., always calling a dog a cat).
3. underinclusion - the use of a word more narrowly than an adult would. e.g., the child calls roses flowers but does not class daisies as flowers.

E. Child usage characteristics of single word utterances between 18-22 months
   1. substantives - the number of substantive words in the child's repertoire begin to increase rapidly.
   2. names - the questioning form "what's that" is learned. e.g., "what's that" used to elicit the names for people and objects.
   3. substantive - the child appears to be using verbs to stand for objects. Earlier in his/her development s/he may have used a noun as a descriptor for an entire situation.

F. Errors made in the productive use of single word utterances.
   1. overinclusion - there is some discrepancy in the literature as to whether overinclusion is systematic or unsystematic.
   2. overinclusion is generally regarded as being systematic in the sense that some features are consistantly used in the child's productive vocabulary. e.g., all objects labeled apple are round and no round object is labeled with any other word.
   3. overinclusion is not viewed as systematic.

G. Functions of single word utterances (13-14 months)
   1. repeating
   2. labeling
   3. answering
   4. calling
   5. greeting
   6. protesting
   7. practice

V. The bridge between one and two word utterances (20-26 months)

A. Chained utterances - chained utterances are characterized by the two consecutive utterances produced by the child in which successive coordinated movements of the child are referred to. e.g., "WALK" uttered as child walks to stairs immediately followed by "CLIMB" as the child begins to climb the stairs that s/he has just approached.

B. Successive single word utterances - similar to chained utterances with the exception that the child's successive single word utterances were premeditated. "successive utterances mapped onto mental representation of a whole event"

Bloom (1973)

C. Functional relations - the meaning of words used by the child depends primarily upon the context and on the meaning of the function word. e.g., more cookie

Errors of vocabulary usage in multiple word utterances. It appears that some words overextended in production are not overextended in comprehension while others are.

e.g.,

·not overextended

when given choice between picture of own father and one s/he's called daddy, the child will only choose the picture of his/her own father.

·overextended

if the child calls furry four-legged creature doggie s/he will choose a picture of one of these creatures equally as often as one of a dog when given a choice between the two.

Miller (1971)

D. Use of "what's that" routine
E. Child answers routine questions
F. Increased frequency of talking

VI. Two word utterances

A. Functional relations
   1. existance - e.g., this (a, the, that, it, there) & substantive word
   2. recurrence - e.g., more (another) & substantive word
   3. nonexistance - e.g., no (away, all gone) & substantive word
   4. rejection - e.g., no & substantive word
   5. denial - e.g., no & substantive word

B. Semantic relations	grammatical form
1. agent-action	noun & verb
daddy hit	
Adam put	
Eve read	
2. action-object	verb & noun
hit ball	
read book	
3. agent-object	noun & noun
mommy sock	
mommy milk	
4. possessive	noun & noun
daddy chair	
5. locative	noun & noun
book table	
verb & noun	
go store	
6. attributive	adj. & noun
big trains	
red ball	

These semantic functions and semantic relations discussed up to this point describe the child's use of productive language through a mean length of utterance of 1.5

VII. Multiword constructions - comprehension
   A. Two years (2)
      1. Child is generally unable to use word order information in a comprehension task.
      2. Child responds more to animation of noun than word order.
      3. Child begins to discriminate between fully grammatical and ungrammatical utterances.
      4. Child has a rudimentary understanding of the differences between declarative, interrogative, imperative, and negative.
   B. Two and one half years (2 1/2)
      1. Child understands that "what" question requires object information.
      2. Child understands that "what do" question requires action information.
      3. Child understands that "where" question requires location information.
   C. Three years (3)
      1. Child understands "whose" question requires possession information.
      2. Child understands "who" question requires name of a person.
      3. Child understands "why" question requires cause or reason.
      4. Child understands "how many" question requires a number.
   D. Three and one half years (3 1/2)
      1. Child understands contrasts for location.
         -in
         -on
         -under
         -beside
      2. Child comprehends word order cues.
   E. Four years (4)
      1. Child makes negative/affirmative statements
         -has/doesn't have

-can/can't -is/isn't (4 years Miller/Yoder)

2. Child uses pronouns as

-object		-subject	
her/them	(4 years	he/they	
him/her	Miller/	she/they	(5 years Miller/Yoder)
him/them	Yoder)	he/she	(3 years)

F. Five-six years (5-6)

Singular/plural — noun (5 years); noun/verb inflection (5 years) } Carrow/Miller/Yoder

Verb inflections
present progressive/future (6 years) Carrow
present progressive past (5 years) Miller/Yoder
future past (6 years) Miller/Yoder

Note to presenter: This represents only a brief overview of syntax comprehension. The included material is probably the most applicable to a SMR/PMR population.

VIII. Multiword construction-production

A. Eighteen to twenty-four months (18-24 mo.)

1. Noun phrase
Form: sentence = modifier + noun
Purpose:
to show possession
to show perceptual attribute
Child uses own name to refer to self

2. Verb phrase
verbs always single and unmodified
main verb unmarked
no auxiliaries
no copula
no inflections
occasional use of verb and particle
omission of use of articles, adverbs and prepositions

3. Negatives
negative elements tacked onto beginning or end of utterance-not embedded
use of no or not for negative

4. Interrogative
yes/no question indicated by rising intonation at end of utterance
no subject-verb inversion
tense and number not marked on nouns and verbs

B. Twenty to twenty-seven months (20-27 mo.)

1. Noun phrase
First occurrence of noun phrase expansions
attribute
possessive
nomination
Appearance of determiner "a" and noun
No inflections present
First occurrence of three term relations
agent + action + locative etc.

2. Verb phrase
no copula
first occurrence of present progressive
first occurrence of irregular past

3. Interrogatives
yes/no questions marked by rising intonation

C. Twenty-six to thirty-four months (26-34 mo.)
1. noun phrase
90% mastery of noun plural
pronouns become more developed
demonstratives "this, these"
2. Verb phrase
90% mastery of
present progressive
insertion of "in" and "on"
irregular past
sporadic use of forms "to be"
first occurrence of:
auxillary -
have + en
be + ing
be + en
3. Negatives
"don't, doesn't" used correctly
"no, not, can't, don't" are in child's repertoire
4. Interrogatives
no inversion of subject and verb
use of *wh* questions is more appropriate

D. Thirty-five to forty months (35-40 mo.)
1. Verb phrase
verb phrase is obligatory
mastery of present progressive
complements appear without object noun phrase
no modals or auxiliaries functioning as auxiliaries occur in affirmative, negative or question sentences
2. Negatives
increased use of negative words
"no, not, don't, won't, can't"
"doesn't, didn't, aren't" are added
3. Interrogatives
appearance of unmarked infinitives

E. Three and one half to seven years (3 1/2-7)
1. and
2. because, so (causal)
3. but (contrastive)
4. where (conditional)
5. while
6. after
7. before
8. past tense

IX. Initiation/response mode
A. Logographic systems- logographs represent word units or ideas and consequently may be easier to learn than systems that represent units smaller than a word (e.g., alphabet). Logographs can be understood regardless of native language.
1. rebus- this system contains 818 different pictures plus over 1200 combinations of rebuses with letters. Advantages:
a. utterances may be left on display for memory facilitation
b. pictures may be manipulated prior to the acquisition of reading and writing

2. Bliss- this symbol system according to its originator (Bliss) is a semantic system. Approximately 100 basic symbols comprise the system. Symbols may be used singly or in combination.

B. Method of stimulus display
   1. scanning- a communication board in which the message display elements are presented to the child in a sequential manner and where the child specifies his/her response choice by responding to a person or display presenting the elements.
   2. encoding- a communication board in which the message display elements are presented in a pattern so that the child must emit multiple signals that must be memorized or located on a chart.
   3. direct selection- any technique where the child directly selects the elements of his/her message from those presented on a board.

      "The system has been used primarily as a means for expressive communication by children who have some language but who are unable to employ functional oral or gestural expression (neuromuscular impairment- severe intellectual impairment)". Clark and Woodcock, 1977.

X. Initiation/response mode-gestures and signing nonlogographic systems
   A. Overview of manual communication
      1. Gestural- several investigators report a developmental sequence in the child's acquisition of motor behaviors that are used intentionally to demand/request and to indicate.
         a. Prior to 10-11 months of age a child will accept an object when offered.
         b. At approximately the same time or slightly later the child will hold up an object to show it to another.
         c. Shortly after, the child will first show and then offer an object to another individual.
         d. At around 13 or 14 months of age the child will point to objects in the environment. It is important to remember that these behaviors can be used to both demand/request and indicate.

            A gestural mode of communication is not necessarily a very efficient mode as the receiver of the message is almost totally bound to the context of the situation in order to deduce the meaning of the "speaker's" communicative action. For example: A child points repeatedly to a toy and I get the toy and give it to the child. Whether or not the child's gestural mode was used to demand/request or indicate depends on whether the child actually accepted the object and played with it or did not want it. (If the child was indicating, his/her points were emitted in an effort to get the adult's attention and not the object.)

            For a low functioning child with reasonably good upper extremity development, a gestural mode is an appropriate early method of communication, since the mode of communicating is very directly tied to the purpose of communicating. e.g., I want something so I approximate an extremity movement in the object direction. A gestural mode of communication can be useful when the child has been observed to exhibit (show, point, give) but has not been observed to readily demand/request and/or indicate. By using a gestural mode in this instance, communicative intent could be assessed or trained without the confounding effects that would occur if an unknown response mode was used as well.

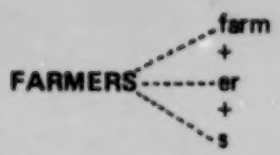
   B. Features of signing systems
      1. Hand configurations used in sign language.
         a. There are 6 basic handshapes found in all sign languages (Battison, 1974)
         b. Each separate handshape is maximally distinctive in appearance.
         c. Approximations of these handshapes serve as the corpus of motor behavior acquired by children in their early sign learning (Bayes, 1973).
         d. Later acquisitions of signs involve variations and combinations of these six handshapes.

Handshapes:
A - Hand: a closed fist
B - Hand: a flat palm
S - Hand: the palm with fingers spread
G - Hand: fist with index finger extended
C - Hand: hand formed in a semicircle
O - Hand: fingertips meet with the thumb; forming a circle

2. Iconic features of sign - a sign that pictorally represents the object or action being symbolized.
   a. use of object present
      1) pointing to object
      2) pointing to the direction of a person or object movement; pointing to the location of a person, place or object
      3) pointing to parts of one's body
   b. associative signs - signs that represent the senses (see, touch, taste, listen, etc.) are formed with gestural references to the body part associated with the sense.
   c. relative/comparative - signs that become iconic in comparison to another known sign (e.g. if you know the sign for stand, you'll recognize the sign for fall).
   d. direct iconic
      1) A sign that pictorally represents what a referent looks like or how it moves (e.g. milk, butterfly, turtle, deer, drink, eat, write, push, pull) (consider including as definition at beginning, e.g., open the door - open the jar; ride the car - ride the horse).
      2) A sign can only be iconic if the learner is familiar with the appearance or action of the referent being symbolized.
      3) One word may have more than one iconic sign depending on how the word is used syntactically (e.g. to plant, to cut)
      4) A word may have more than one iconic sign to illustrate the object use even though the meaning of the word remains the same (e.g., open the door - open the jar; ride the car - ride the horse).
3. Motoric features of handshapes
   a. both hands move in direction of midline and involve the use of the same handshape (e.g., ball).
   b. both hands form the same handshape and perform the same motion (informal go, come).
   c. one hand is used in making the sign and one handshape is formed
      1) one movement
      2) repetitions of movement
   d. both hands form the same handshape; one hand is stationary and one hand is in motion (e.g. car, good).
   e. each hand forms a different handsahpe; one hand is stationary and one hand is in motion (simple sign for pop).
   f. one hand or both hands in forearm rotation
      1) one handed (e.g. blue and most color words)
      2) two handed (ploy)
   g. both hands used to make signs using the same handshape in alternating movements (popcorn, formal come & go).
   h. each hand forms a different handshape
      1) both hands in motion
      2) voluntarily shaking both hands
4. Sensory overlay on motor breakdown of signs
   a. visible/invisible
   b. tactile
      1) hands touching hands
      2) hands touching one place on body
      3) hands touching two places on body
      4) hands not touching body at all

C. Examples of formal signing systems

1. Paget - Gorman systematic sign. This system of communication was developed with the belief that when the child had outgrown the system, s/he would discard it. The system relies on 39 basic signs used in a variety of combinations. A basic sign is used to denote general classes of objects such as people, food, animals, etc. The hand position used to emit the sign may be used to denote more specific information (e.g., animal + jump = frog, kangeroo). There are also signs used to form plurals, tenses, possessives, comparatives, parts of the body, etc. There is only one meaning per sign; with exceptions such as frog; kangeroo.
2. Signing Exact English. This system includes 2100 words, 70 affixes and 7 contractions. Words are divided into basic words, complex words and compound words. The system uses the same sign for two English words if those words are alike in two of three features (pronunciation, spelling, meaning). ASL signs are usually used. Regular plurals are formed by signing s after the noun. See attempts to follow English morphology. e.g.,



3. Manual English. This system is designed to be used in conjunction with normal speech. This system incorporates the use of finger spelling. Many ASL signs are used. This system is not particularly applicable to severely delayed populations.

D. Fingerspelling

1. There is one configuration for every letter of the English alphabet.
2. Different languages utilize different fingerspelling systems (some systems are two handed).
3. In conversation, fingerspelling is decoded by shape of the total word rather than by combining individual letters.
4. Features contributing to the shape of a finger spelled word.
   a. iconic letters (c, i, j, l, o, v, w, y, z)
   b. double letters (repetative ee, oo, closed letters are blinked) 11 open letters moved laterally
   c. orientation of letters
      1) down- pq
      2) up- b, d, f, k, l, r, u, v, w
   d. motion letters- j, z.

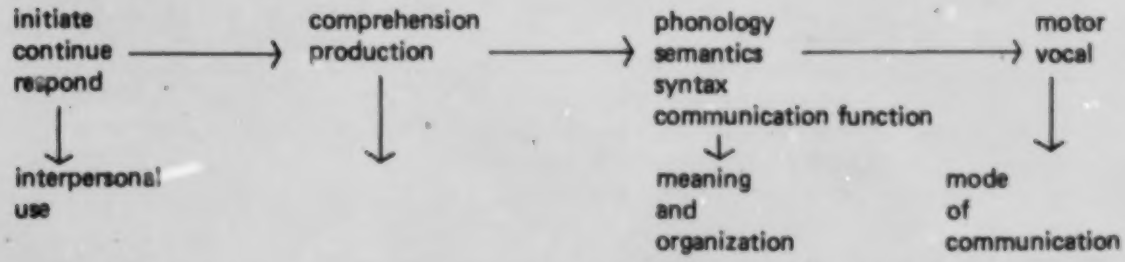
E. Criteria for selection of signs to teach

1. Choose signs that are iconic
   a. maintains use of action required to appropriately use object
   b. child is able to use the redundant cue of functional object use
   c. allows less abstract level of representation
2. Choose signs that may involve some hand movement that are readily observable in the child's repertoire.
3. Choose signs that are highly visible.
4. Choose signs consistent with the representation of a variety of semantic functions.
5. Choose vocabulary consistent with the child's educational/home experiences.
6. Choose signs that have a high probability of occurrence.
7. Choose signs that involve potentially reinforcing experiences for the child.
8. If training sets of signs, different signs involved in the set should look dissimilar in configuration.

I. Overview: Assessment

Communicative assessment is somewhat like a pie that can be sliced in a variety of different ways.

Examples:



This section of the communication module attempts to address all of these aspects of assessment but is not represented as an indepth study of communicative assessment. In addition to early communicative assessment, the presenter should also address the assessment of selected precommunicative behaviors that may overlap the related areas of motor and cognitive development.

A. The purpose of the evaluation
   1. Screening - the process by which communicatively normal children are separated from delayed or abnormal communicating children.
   2. Program entry evaluation - the process by which specific areas of communicative deficiency are discovered as well as the extent of the deficiency.
   3. Verification of training success - the process by which the teacher/caregiver evaluates progress made in specific area of communication that was selected as an area of skill establishment or modification.

B. Critical areas to assess prior to a language evaluation
   1. Oral mechanism - it is possible that a child's productive use of verbal communicative behavior is impaired as a result of physiological deficiencies of the oral mechanism. This assessment should be conducted by a speech therapist.
   2. Auditory mechanism - it is possible that both the ability to comprehend as well as produce verbal communication is impaired because of an auditory deficiency.

II. Audiological management

A. Parts of the ear
   1. Outer ear - sound begins as the vibration is transmitted through the air. These vibrations travel in the outer ear.
   2. Middle ear - sound vibrations impinge on the tympanic membrane. The membrane vibration, in turn, moves the three bones of the middle ear. As vibrations cause movement of the bones the magnitude of the sound is amplified.
   3. Inner ear - the ossicles adjoin the round window of the cochlea. When vibrations reach the round window they set up a fluid movement. This movement, in turn, causes a nerve impulse which is transmitted to the brain.

B. Types of hearing loss
   1. Conductive hearing loss
      a. "Interference of any sort in the transmission of sound from the external auditory canal to the inner ear. . ." - Northern & Downs (1974)
      b. Sounds conducted to the inner ear via bone conduction of skull and temporal bone are not affected.

c. Most conductive losses can be corrected through:
   1) medical treatment
   2) surgery

2. Sensorineural hearing loss
   a. "Damage has been sustained by the sensory and organ or cochleas hair cells. . .
      or
      . . . faulty function of the auditory nerve.
   b. This type of hearing loss is nearly always irreversible.
3. Mixed hearing loss
   a. The presence of both a conductive and sensorineural loss.
4. Central auditory dysfunction
   a. This disorder is often represented by a decrease in auditory comprehension (e.g., unable to recognize or interpret speech).

C. Severity of hearing loss (considerations)
   1. Unilateral (one ear) or bilateral (both ears)
   2. Conductive, sensorineural or mixed
   3. Amount of pure tone loss
   4. Speech reception threshold
   5. Discrimination
   6. Special assessments
   7. Impedance - "An objective means of assessing the integrity and function of the peripheral auditory mechanism (Northern and Downs 1974). Uses of impedance include:
      a. determining existing middle ear pressure
      b. tympanic membrane mobility
      c. eustachian tube function
      d. continuity and mobility of middle ear ossicles
      e. acoustic reflex thresholds
      f. nonorganic hearing loss

D. Disorders accompanying hearing loss
   1. Cerumen (a waxy substance produced to protect ear from small foreign bodies)
      a. A massive accumulation occludes the ear canal
      b. Hearing loss is not a major concern
      c. These cases should be referred to a physician
   2. Otitus media
      a. Serious
         1) The eustachian tube becomes closed and/or blocked creating a closed unventillated middle ear space.
         2) Hearing impairment may occur as the result of a retracted tympanic membrane and negative middle ear pressure.
         3) Serious otitus is common in children between three and eight years of age.
         4) Pain is usually intermittant and mildly acute.
            a) sudden onset with pain
            b) pain subsides if eardrum ruptures
      b. Chronic
         1) Prevalent discharge from the ear accompanied with a perforation of the tympanic membrane.
         2) Severe forms of otitus media may or may not damage the middle ear ossicles
            a) important variables
               i. severity
               ii. duration
         3) A referral to a physician is appropriate if otitus is expected.

3. Cochleas Trauma (skull factures)

E. Congenetal disorders
   1. Congenetal syphilis
   2. Rh incompatability
   3. Viral diseases
      a. Rubella
      b. Meningoencephalitos
      c. Chicken pox
      d. Infectious menihgitus
      e. Mumps
   4. Bacterial postnatal infections
      a. Streptococcus
      b. Staphylococcus

III. Procedures and Protocol for Audiologic Assessment of Pediatric and Special Populations (BOA, VRA & Play Audiometry)

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Statement of Purpose

Until recently, it was largely believed that accurate assessment of auditory function in infants required the use of entirely "objective" procedures. The idea being to limit theinfants' participation in the assessment process (Wilson, in press). There are, indeed, some populations for which "objective" measures (e.g., various electro-physiologist techniques) are the most viable alternative. However, numerous investigations (Eisenberg, 1965, 1970, 1974, 1976; Fulton, Hoverston and Moncur, 1969; Murphy, 1962; Northern and Downs, 1974; Sheridan, 1957; Suzuki and Ogiba, 1961; Thompson and Thompson, 1972; Thompson and Weber, 1974) have clearly demonstrated most infants and difficult-to-test clients can be assessed effectively by behavioral audiometric techniques.

The results obtained by applying operant conditioning principles to populations twenty-four months of age and younger, have been particularly encouraging (Lloyd, 1966; Lloyd, Spradlin and Reid, 1966; Moore, Thompson and Thompson, 1975; Moore, Wilson and Thompson, 1977; Wilson, Moore and Thompson, 1976). Stimulus, response and reinforcement aspects have been studied and efforts made to develop and implement procedures consistent with each child's developmental level (ie., response capability). Moore, Thompson and Wilson (e.g., Moore, Thompson and Thompson, 1975; Moore, Wilson and Thompson, 1977; Moore, et al, 1976; Thompson and Weber, 1974) have all contributed significantly to studies on the effects of various reinforcement conditions and have supplied preliminary normative data for infants 6 months of age and up. Eisenberg (1964; 1976), Northern and Downs (1974) and others have performed comprehensive analyses of auditory development.

Despite this influx of clinical information, the area of pediatric auditory assessment lacks standardized clinical protocol. This is due, in part, to the relatively recent emergence of the field and to a lack of public information and professional research in certain critical areas.

Behavioral audiometric assessment of infants (and special populations), as defined by recent developments in the literature, has need of extensive in-service training efforts. These efforts must, however, be predicated upon a systematic plan for such audiologic assessment. In turn, some critical research questions must be answered to better specify a valid, reliable and justifiable protocol. It is our intended purpose to try to meet these needs by adapting and modifying the general guidelines outlined below through clinical use and systematic research.

Procedures and Applications

PTA: Pure-Tone Audiometry (developmental level (DL): 24 months +)[1]- For children above 6 years of age, routine audiometric procedures may be applied for both pure-tone and speech audiometry measures, (Carhart and Jerger, 1959; Northern and Downs, 1974). Children of 5-6 years old may require some modification of speech materials to accommodate their level of linguistic development, but routine pure-tone procedures may be employed.

Children from 24-59 months of age will require modification of speech materials, as well as modification of the response aspect of pure-tone audiometry. This technique, known as play audiometry, requires the child to place an object in/on a receptacle at the onset of the stimulus (Northern and Downs, 1974; Thompson and Thompson, 1972; Thompson and Weber, 1974). It is worth mentioning that the specified pre-stimulus state, inter-stimulus interval and defined response have a direct bearing upon the child's responsibility to this task. This appears particularly critical for developmentally delayed populations (Kenworthy, 1977). It might well be that the lower limit of developmental level for this task is below the 24 months previously reported (Thompson and Weber, 1974) and considered a standard. Task analysis of the response required should suggest that:

a) allowing the child to assume a natural attending set, and
b) substituting a reach to midline (plus pick up object)

will simplify the task considerably. Clinical investigations would suggest that this modification of response pattern plus careful control of ISI will drastically increase response success for client's behavior below a 24 month developmental level (Kenworthy, 1978).

VRA: Visual Reinforcement Audiometry (DL 5-24 months) - In this paradigm, stimuli may be presented either in sound field or under earphones. The procedure selected (sound field or earphone) is dependent upon the child's developmental level and tolerance of earphones. In either case, the child is presented with a stimulus, a response is exhibited (preferably localization), and this response (if appropriate) is reinforced by activation of a mechanical toy. Also, measurements achieved in either case require an examiner/observer team consisting of one examiner in the control booth and at least one observer in the test suite with the child. Specific procedures for each variation are detailed below.

VRA/Sound Field (DL: 4-24 months): Application of this technique assumes the child possesses sufficient head control to localize and sufficient visual acuity to respond to the reinforcer.

Initial presentation occurs at 30 dBHL, with subsequent 20 dB increases in intensity until the child responds. Presentation is repeated at the level of the initial response, as a reliability check. An inter-stimulus interval (ISI) of approximately 10 seconds should be employed between successive stimulus presentations, whether during ascent or during the threshold search, (bracketing of a minimum response level - MRL).

Bracketing of an MRL should not begin until two responses occur at a given level. Once this occurs, a bracketing technique, with 20dB (descending) and 10dB (ascending) steps, should be used to

[1]All age levels cited are referenced to the developmental capabilities of a child, of that chronological age, who suffers no developmental/behavioral delay, deviancy and/or disability.

derive an estimate of MRL. MRL is defined as the lowest level at which 3 responses are obtained in six stimulus presentations (Wilson, in press).

Should a child fail to respond appropriately, and the intensity level reaches 70dBHL:

1) a training session will be initiated, if the child has indicated some form of behavioral response (e.g., alarm, cessation, etc.), or,
2) if no behavioral response is noted, the child will be referred for further programming.[2]

Training sessions should involve presentation of the stimulus for a period of approximately one second, followed by presentation of the reinforcer.[3]

The child's attention should be directed toward the stimulus at the onset and held there until the reinforcer is presented. Diverting the child's attention toward the stimulus may require various prompting or physical assistance, but this should be faded out with each successive presentation. A child can be considered under initial stimulus control only when he/she emits a minimum of two successive, non-prompted responses. Overall, results are considered valid and reliable only when hit/miss and correct rejection/false (+) ratios are 0.90 or better.

The stimulus will remain on while the reinforcer is presented, during training. During actual assessment, however, the stimulus will terminate once the response occurs and reinforcement is delivered.

VRA/Earphone (DL: 6-24 months): Moore, et al (1976) have demonstrated that "auditory thresholds" can be obtained, under earphones, for infants as young as six months. Performance under earphones, however, should be contingent upon obtaining results with VRA/Sound Field and upon the child's acceptance of earphones.

The initial level of presentation should be set at the MRL in sound field plus 20dB. The stimulus should first be presented alone, and appropriate responses reinforced. If no response occurs, a training session should be initiated per procedures detailed earlier for VRA/Sound Field. Also, the criteria for stimulus control and procedures for bracketing and defining MRL will be the same as for VRA/Sound Field.

TROCA/VROCA: Tangible/Visual Reinforcement Operant Conditioning Audiometry (DL: 5-24 months) - [Same basic procedures as VRA but with different instrumentation (see Lloyd, 1966)] The fundamental procedural difference lies in the reinforcement type and the response utilized. Whereas VRA relies upon secondary reinforcement only, TROCA/VROCA often makes use of primary reinforcement as well. In addition, VRA relies upon reinforcement of a spontaneously emitted operant (localization) while TROCA/VROCA procedures specify detailed shaping procedures for establishing the desired operant (bar press, head turn, etc.).

BOA: Behavioral Observation Audiometry (DL: birth to 4 months) - For children who fail to condition to VRA (i.e., - localize appropriately), for very young infants and neonates, BOA procedures will be employed.

This procedure involves an initial presentation at 30dBHL with 20dB increases in intensity until a stimulus locked behavioral change occurs. The same bracketing procedure and threshold criteria as VRA will be applied. (Thompson, personal communication).

It is worth mentioning that utilization of electro-physiologic measures (e.g., - EEA or brain-stem audiometry) as a concomitant procedure is most efficacious. Individually, BOA and electro-physiologic measures are subject to a great deal of error (Northern and Downs, 1974). Taken

[2]The term "programming" is intended to provide the option to either train a child extensively and/or refer him/her for evaluation with electro-physiologic or other measures.

[3]The stimulus and response must always precede delivery of reinforcement. Therefore, the on time of the stimulus may vary, since the reinforcement should not be delivered until the desired response occurs, and the stimulus should not be terminated until the response occurs.

together, however, these techniques comprise an effective test battery for assessment of hearing sensitivity in neonates, young infants (4 months or less) and other populations of a similar developmental level.

Response Definition

Regardless of procedure, the child's response set is subject to a high degree of variability. Therefore, judgements regarding presence or absence of response must be made independently by both an examiner and at least one observer (Hoverston and Moncur, 1969; Moore, Thompson and Thompson, 1975; Northern and Downs, 1974; Watrous, et al, 1975). A response can only be counted if agreement occurs between examiner and observers(s).

Previous studies have demonstrated that inter-judge reliability usually ranges from 85-96%, depending upon the specificity of criterion applied (Hoverston and Moncur, 1969; Moore, Thompson and Thompson, 1975; Watrous, et al, 1975). Therefore, it is imperative that judgement criteria for a response be clearly defined. In addition, control (silent) intervals will be interjected to assure that stimulus presentations are not coinciding with a random behavior (Moore, Thompson and Thompson, 1975; Wilson, Moore and Thompson, 1976.).

For purposes of pure-tone (including play) and TROCA/VROCA procedures the response required is a volitional, motor act which is clearly stimulus locked (e.g. - hand raising, dropping a block in a can or bar pressing). The determination as to whether the behavior is stimulus related is based upon the child's response rate during control intervals. The false positive rate is acceptable when false (+) responses occur in less than 10% of the control intervals.

For VRA, the child must clearly localize. The term localize is defined as a stimulus locked turning of the head in the direction of the sound source (sound field) or reinforcer (earphone). Gaze diversion (eye movement) is not sufficient to score a response.

For BOA, a response is considered to occur when the examiner and observer agree as to the presence and type of behavioral change. The method for scoring behaviors is detailed in Hoverston and Moncur (1969). The behaviors acceptable as responses are detailed in Hoverston and Moncur (1969); Northern and Downs (1974); and Watrous, et al (1975).

Furthermore, for both BOA and VRA, a response is considered stimulus locked only when the false positive rate (occurrence during control intervals) is 10% or less. For all procedures (play audiometry, VRA, BOA) a control interval will be interjected following each third stimulus presentation. The interval will replicate a stimulus/reinforcement interval in every regard, except no stimulus or reinforcement is delivered. A blind design will also be used to validate the judgements of the observers (Moncur, 1968; Weber, 1969). The term blind design refers to the observers not being informed whether a test interval is a control or a stimulus/response interval.

Stimuli

For routine pure-tone audiometry (DL = 6 years +), stimuli will coincide with those in routine clinical use with adult populations. When the developmental level of the child is 5-6 years, pure-tone stimuli remain consistent with the preceding. Speech stimuli, however, will be children's spondees and PB-K monosyllabic words.

When play audiometry is employed, presentation of pure-tone stimuli will vary according to previously outlined procedures. Object/picture identification thresholds and the *Word Intelligibility by Picture Identification* (WIPI) *Test* (Ross and Lerman, 1971) will be substituted for routine speech reception threshold and speech discrimination measures, respectively.

A variety of stimuli will be used for VRA and BOA. These will include complex noise, speech, white noise, computer synthesized noise, warble tones and assorted noisemakers. All stimuli will be taped, as well as filtered, to offer increased frequency and intensity specificity (Brandy, 1966; Hoverston and Moncur, 1969; Coleman and Pelson, 1977). In addition, noisemakers will be presented live (in the test suite with the child) for BOA. Live presentation of noisemakers will be controlled

across various signal parameters by the procedures outlined in Eisenberg (1964; 1976) and Northern and Downs (1974).

Initially, the primary stimuli employed for VRA will be band pass (500-2000H_Z) complex noise and 300 Hz warble tone. This is done to provide consistency with previous studies (Moore, Thompson and Thompson, 1975; Moore, et al, 1976; Northern and Downs, 1974; Thompson and Weber, 1974; Wilson, et al, 1976). In addition, these stimuli offer a sampling of the critical speech band, as well as, high frequency sensitivity (Coleman and Pelson, 1977). The complex noise also allows assessment of the speech frequencies without added complications of propositionality and extreme frequency and intensity variations across examiners (Brandy, 1966). Also, the order of presentation will always place complex noise first in order to insure maximum responsiveness from the child (Eisenberg, 1976; Hoverston and Moncur, 1969; Thompson and Thompson, 1972). The results obtained with these stimuli also form a basis for research into such factors as stimulus choice, inter-stimulus interval, etc.

For intial BOA investigations, the primary stimuli should be noisemakers (live) as suggested by Northern and Downs, (1974). However, research should be conducted to compare infant and neonate responses to loudspeaker generated stimuli as a function of distance from the subject (Sheridan, 1957). Such an effort might also compare young infant and neonate responses as a function of stimulus and intensity.

Referral Criteria

The criteria for normal hearing with routine pure-tone audiometry are well documented and longstanding (Chaiklan, et al, 1975). Thompson and Weber (1974) and Lloyd (1966) have further suggested these same criteria may be applied to pure-tone results obtained via play audiometry and TROCA.

The traditional concept of normal hearing must be abandoned, however, when considering VRA and BOA procedures. As yet, no concise data are available from which normative data may be generalized across varied clinical settings (Moore, et al, 1976). Nevertheless, some guidelines exist for considering whether a child is at risk for hearing loss, when VRA and/or BOA measurements are employed.

Based upon current literature (Moore, et al, 1976; Northern and Downs, 1974; Thompson and Weber, 1974; Wilson, et al 1976), a child can be considered to have hearing sensitivity adequate for communicative purposes, when:

1) by VRA (MAF or MAP), he/she exhibits an MRL to filtered complex noise and warble tone at less than or equal to 45dBSPL (approximately 30dBHL) exhibits no middle ear dysfunction, based on acoustic-impedance studies.
2) by BOA, he/she exhibits an MRL to filtered complex noise or selected noisemakers less than or equal to 85dBSPL (approximately 70dBHL) and exhibits no middle ear dysfunction, based on acoustic-impedance studies.

In addition, all children assessed by VRA/Sound Field and BOA should be followed routinely at 6 month intervals. This is intended to compensate for the limitations of these procedures in identifying unilateral and/or specific high frequency losses of hearing sensitivity. It is further acknowledged that BOA, VRA and play audiometry are only measures of hearing sensitivity and not measures of higher level processing, e.g., speech discrimination, auditory sequencing, etc. Any comprehensive and precise statement regarding hearing status requires inclusion of data in the areas of speech/auditory discrimination and central auditory processing.

References

Brandy, W., "Reliability of Voice Tests of Speech Discrimination," J. Speech Hearing Res., 1966, 461-465.

Carhart, R. & Jerger, J., "Preferred Method for Clinical Determination of Pure-Tone Thresholds," JSHD, 24: 330-35 (1959).

Chaiklan, J.B., et al, "Guidelines for Identification Audiometry," ASHA Mag, 17 1975, 94-99.

Coleman, R.O., and Pelson, R. O., "Marked High Frequency Hearing Loss in Children: A Problem in Early Identification," JSHD, 42: 3, 335-339 (1977).

Eisele, W.A., Berry, R.C. and Shriner, T. H., "Infant Sucking Response Patterns as a Conjugate Function of Changes in the Sound Pressure Level of Auditory Stimuli," J. Spch. Hrg. Res., 18, 296-307 (1975).

Eisenberg, R.B. Auditory Competence in Early Life: The Roots of Communicative Behavior. Baltimore, Md.: University Park Press, 1976.

Hoverston, G., and Moncur, J., "Stimuli and Intensity Factors in Testing Infants," JSHR, 687-702 (1969).

Kenworthy, O.T., Unpublished data on three multiply handicapped clients conditioned to play audiometry. October, 1978.

Lloyd, L., "Behavioral Audiometry Viewed as an Operant Procedure," J. Spch. Hrg. Dis., 1966, 31, 128-136.

Lloyd, L., Spradlin, J. and Reid, M., "The Application of TROCA (Tangible Reinforcement Operant Conditioning Audiometry) to the Testing of Infants," Demo Project REport No. 62. Parsons Kans.: Parsons State Hopsital and Training Center, 1966.

Moore, J.M., Thompson, G. and Thompson, M. "Auditory Localization of Infants as a Function of Reinforcement Conditions," JSHD, 40:1, 29-34 (1975).

Moore, J.M., Wilson, W.R., Lisslis, K.E. and Talbot, S.A., "Earphone Auditory Thresholds of Infants Utilizing Visual Reinforcement Audiometry (VRA)," Paper presented at the annual meeting of the American Speech and Hearing Association, Houston (1976).

Moore, J.M., Wilson, W.R. and Thompson, G. "Visual Reinforcement of Head Turn Responses in Infants Under Twelve Months of Age," JSHD 42:3, 328-334 (1977).

Murphy, K.P. "Development of Hearing in Babies," Child Family, 1, 1962.

Northern, J. and Downs, M.P., Hearing in Children, Baltimore, Md.: Williams and Wilkins, 1974.

Ross, M. and Lerman, J. "The Word Intelligibility by Picture Identification Test," Pittsburgh: Stanwix House, Inc., 1971.

Sheridan, M.D., Manual for the STYCAR Hearing Test, Mere, Upton, Park, Slough, Bucks: Nat'l. Foundation for Ed. Research in England and Wales, 1957.

Suzuki, T. and Ogiba, Y., "Conditioned Orientation Reflex Audiometry," Arch. Otolaryng., 74, 192-198 (1961).

Thompson, M. and Thompson, G., "Response of Infants and Young Children as a Function of Auditory Stimuli and Test Methods," J. Spch. Hrg. Res., 15, 1972, 699-707.

Thompson, G. and Weber, B., "Responses of Infants and Young Children to Behavioral Observation Audiometry (BOA), J. Spch. Hrg. Dis., 1974, 39, 140-147.

Watrous, B.S., McConnell, F., Sitton, A.B., and Fleet, W.F. "Auditory Responses of Infants," JSHD, 40: 3, 357-366 (1975).

Wilson, W.R., "Sensory Assessment: Audiotory Behavioral Assessment of Auditory Function in Infants," to appear in: Minifie, F.D. and Lloyd, L.L. (Eds), Communicative and Cognitive Abilities–Early Behavioral Assessment. Baltimore, Md.: University Park Press, in press, 1977.

IV. Hearing aids
- A. Basic components
  1. Microphone - an energy transducer that converts mechanical acoustic energy to an electric current.
  2. Amplifier - this component increases the amplitude (voltage) of the electrical signal.
  3. Receiver - a microphone in reverse. A receiver converts an amplified electrical signal to sound energy and transmits it to the ear.
  4. Power supply.
  5. Volume control.
- B. Types of hearing aids
  1. Body aids.
  2. Ear level aids.
  3. In the ear aids.
- C. Trouble-shooting malfunctioning aids

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The following problems may be encountered in the day-to-day management of persons with hearing aids:

1. "Squeal" or feedback (acoustic) - this problem generally results from a poorly fitted, or improperly inserted earmold. Sound leaking out of the ear is picked up by the hearing aid microphone, causing the feedback. The nearer the microphone to the receiver, the more likely it is that feedback could occur. It is more often a problem with very powerful, ear level hearing aids, since the greater sound pressure that is generated requires a better earmold seal (fit) if the likelihood of feedback is to be lessened. It can also be more of a problem when vented, or open earmolds are used.
   It is normal to experience some feedback whenever the instrument is covered by the hand, or sometimes when wearing headgear that covers the hearing aid (hat or scarf).
   The presence of excessive ear wax (cerumen) may cause feedback or may result in some other symptom of hearing aid malfunction (dead or weak aid). A physician should be consulted in order to check and, if necessary, clean the ear canals.
   The following steps will help locate the cause of the feedback:
   a. Remove the aid from the ear and with volume nearly full on, place a fingertip

over the earmold opening. If the squeal stops, the problem is in the earmold fit. It may need replacement. It should be reinserted to be certain that the problem is not simply one of improper positioning in the ear.

b. If the aid still squeals excessively, remove the earmold from the receiver, and place the fingertip over the receiver opening. If the squeal stops, the problem is in the coupling of the earmold to the receiver. New washers may solve the problem. If not, the coupling may be worn on either the earmold, receiver, or both. Replacement of the parts may be necessary.
For ear level instruments, the mold and tubing can be removed from the plastic coupler. If a fingertip over the opening in the coupler results in cessation of feedback, the problem is with the earmold or tubing. Your hearing aid dispenser should be consulted.

c. If, when a fingertip is placed on the receiver opening (or, in the case of ear level aids, over the open end of the plastic coupler or sound conducting opening in the instrument) feedback continues, the problem may be mechanical feedback within the body of the aid, or resonance from the receiver case. Your hearing aid dispenser should be consulted.

d. Repositioning of the hearing aid and harness may be necessary in order to obtain adequate isolation of the receiver from the microphone. (For example, if the receiver is in the left ear, the aid may need to be worn at a point low and to the right of the torso.)

2. Dead aid. No sound at all

a. Check the battery, or try a new one. Note that the plus and minus signs on the hearing aid battery should correspond with the plus and minus signs in the battery compartment of the hearing aid. If the battery contacts in the battery compartment appear to be corroded, they can be cleaned. The use of abrasives may damage the electrical contacts. Cleaning should be done by a hearing aid dispenser.

b. Check the microphone-telephone switch. In the M, or microphone, position, the instrument will operate normally and will respond to all sounds within its range. When set to the T, or telephone, position,
the instrument will respond only to sound transmitted over a telephone when the instrument is held near the telephone receiver or when within range of a classroom induction loop system. Some hearing aids have a combination TM setting which allows the use of both modes at the same time.

c. Check the cord. Place the receiver in your ear and with the aid turned on, gently move and roll the cord between your fingertips. This should be done at two points--near the receiver and near where the cord plugs into the hearing aid. A broken cord will be characterized by intermittent functioning of the aid when this maneuver is done.

d. Check the earmold. If the mold is plugged with earwax, it can be cleaned effectively with warm, soapy water and a pipecleaner. Care should be taken that no water remains in the sound conducting hole in the earmold or in the tubing that connects the earmold to some hearing aids. Alcohol should not be used to clean earmolds as it will dissolve some plastics.

e. If none of the above efforts restore function, return the instrument to the dispenser.

3. Weak or distorted sound

a. Check the battery or try a new one. Check the battery contacts.

b. Inspect earmold and tubing for partial plugging.

c. Check tone controls and volume control. A dirty volume control--the output of the aid is weak and fairly constant as control is advanced--is often to blame. This

requires cleaning and servicing.

d. Exposure to extremely cold temperatures will temporarily reduce the efficiency of transistor amplifiers and mercury batteries. When the instrument is warm, it will function properly. Modern hearing aids are designed to withstand a wide range of temperature extremes--much more so than are likely to be encountered in this climate.

4. Intermittent functioning
   a. Check the cord as above.
   b. Rotate volume and tone controls. Dirty controls may cause the problem. If this is the cause, the aid should be cleaned and serviced.
   c. Inspect battery contacts.

V. Assessment of early communicative awareness and discrimination

A. Gross awareness - the ability to demonstrate a change of state as a direct result of the application of an auditory, visual, tactile stimulus

B. Tracking - the ability to visually pursue a moving object
   1. Midline to side
      a. slow moving
      b. rapid moving
   2. Side to midline
   3. Circular
   4. Jerky tracking
   5. Smooth tracking

   varying stimulus presentation

   response sophistication

C. Scanning - the ability to shift gaze back and forth between two objects
   1. Size of objects
   2. Color of objects
   3. Distance of objects from child's face

D. Localization - the ability to find the source of an auditory stimulus
   1. Lateral localization
   2. Vertical localization

   position of stimulus

   3. Locating object presented behind child
   4. Intensity of stimulus
   5. Duration of stimulus
   6. Brightness of visual stimulus
   7. Frequency of auditory stimulus
   8. Interstimulus interval

   stimulus characteristics

E. Line of regard - the ability to shift gaze in response to the shifted gaze of a communicative partner

F. Awareness of familiar/stranger - the ability to show differential behavior in contrasting voice of familiar from stranger

G. Reach---see motor module

H. Grasp---see motor module
   1. Instinctive
   2. voluntary

I. Swiping---see motor module

J. Stationary batting---see motor module
   1. Moving object - batting at an object that is moving toward the child.
   2. Stationary object---an object positioned at a constant distance from the child.

K. Vocal frequency
   Mutual imitation — defined previously in this module
   Vocal imitation

L. Accept---the ability to reach out and take an object that has been offered by another individual

M. Show--the ability to approach another, reach out, and offer an object to another
N. Give--the ability to approach and place an object in another's hand and/or lap.
O. Point--the ability to extend arm/hand in the direction of a distanced object.

It is important to stress the interaction of motor, cognition and communication in the acquisition of these skills.

VI. Assessment of the transition between situational and linguistic comprehension
  A. Situational comprehension
    1. Redundant cues
      a. facial expressions
      b. speech/lip reading
      c. repeating an utterance
    2. Comprehension strategies
      a. line of regard
      b. do as another does
      c. do what you usually do, etc.
      (refer to section described in communicative development section)
  B. Linguistic comprehension
    1. Words associated with routines
    2. Proper names
    3. Common names
    4. Common actions
    5. Common locations and attributes
    6. Combinations of basic one term semantic functions

VII. Comprehension of questions- the comprehension and production of questions or interrogative forms is of importance since a substantial effort of the teacher is expended attempting to teach young children to understand directions and ask for feedback. Shatz (1975) added a critical dimension to the assessment of early instruction following behavior. She devised a system of categorizing the child's incorrect responses to demand/requests as well as the child's correct responses.
  A. Children's Answers to Questions
    It has been established that requests issued by adults to children between twelve and twenty-four months of age are often motor cued. Shatz (1975) found that 100% of imperatives and 87% of question directives uttered by adults to children during this time frame of development were motor cued.
    Between twelve and twenty-four months of age there are a variety of behaviors that the child is apt to emit in response to questions.
    1. ignore - no acknowledgement is made by the child that would indicate that s/he received the message from the other speaking partner.
    2. negative - an acknowledgement that the message was received which is accompanied by a lexical item representing the semantic function of denial or rejection.
      e.g.,
        Did you hit Tommy———no
        Do you want to talk to me———no
        Will you please come here———no
      As can be seen from the examples, a negative response can be construed as either an appropriate or inappropriate response in terms of compliance. It must be remembered, however, that in all of the examples above, the responses are semantically appropriate.
    3. look - an acknowledgement that the speaker's message was received but that no further action was taken.
    4. request for clarification - an acknowledgement that the speaker's message was received but not directly interpretable, and that additional or more specific information is needed.

5. indeterminate - an acknowledgement that the speaker's message was received. In an indeterminate response, the child begins to respond but for some reason does not complete the utterance or action that would be considered an appropriate response.
6. appropriate - an acknowledgement that the speaker's message was 1) understood and 2) interpreted appropriately. Appropriate responses may be divided into motor actions and verbal utterances.
   a. verbal utterances: Chapman (1974) has outlined ages at which children respond to different question types by supplying the appropriate semantic information. Criterion for mastery was 70% appropriate responses.
   yes/no——sometime after 2.0 years

   what
what do
where (place)
where (location) — sometime after 2.5 years

   whose
who
why
how — sometime after 3.0 years

   how many——— sometime after 3.5 years

   how much
how long — sometime after 4.0 years

   how far ——— sometime after 4.6 years

   how often——— sometime after 5.0 years

   how long
when — sometime after 5.5 years

   The significant point to be stressed is that there are many question forms to which the child will not be able to respond appropriately. The reason for the response insufficiency may well be due to the child's level of language development rather than due to his/her general lack of compliance. On the other hand, it is very possible that some apparent comprehension displayed by the child is not so much a demonstration of comprehension but instead is an indication of awareness of the motor cues being provided by other individuals.
   b. motor responses - a number of potential motor responses have already been discussed.

B. Cromer (1974) said that "What is important in language acquisition is not so much what is comprehended by an individual or group of individuals but how they come to comprehend it."

In comprehension the assessor is primarily interested in discovering the child's understanding of verbal units produced by another and not how the child used contextual assistance that the child may have received. This means that in comprehension per se it is desirable to control as much as possible the context under which understanding is assessed. Comprehension assessment devices like other assessment devices discussed thus far may consist of elicitation observation or interview procedures. One important decision that the clinician must make is whether his/her assessment of understanding is designed to assess reception or comprehension.

1. The distinction between the assessment of reception and comprehension.
   a. In comprehension, the child is capable of understanding a given lexical item or combination of lexical items in a variety of situations, at a variety of different

times with a variety of different people (an open set).

b. In reception, the child need only identify a given lexical item based on some sub set of its critical dimensions given a closed set choice. e.g., child may identify a hammer from a dog and cat on the basis of animation vs. inanimation. The child may not know for what the hammer is used, nevertheless s/he can identify it.

c. The majority of elicited assessment devices designed to examine comprehension skills actually identify receptive skills. e.g., Peabody Picture Vocabulary Test; Carrow; ACLC.

2. Several individuals have devised a simple procedure for examining early comprehension skills using an elicitation procedure (Miller, Chapman, Reichle & Branston, 1977). (At this point presenter should briefly describe the following procedure.)

a. Teacher or clinician obtains a list of words that child "knows" at home.

b. Clinician also has list of words and word combinations (dependent upon level of child) to which the child might frequently be exposed.

c. The child is placed on floor surrounded by a variety of objects.

d. The clinician/teacher then procedes to attract the child's attention. Upon doing so s/he asks "Where's the " or make (object) (act) etc. The clinician is careful throughout the examination to visually or motorically cue the child's response.

e. If the child does not respond in the preceding assessment task, it may be necessary to determine whether the child will respond appropriately if s/he is given motor visual or extra verbal cues.

McLean et al (1977) have listed some questions that may be helpful in gleaning information on the child's use of verbal/vocal heretofore unmentioned comprehension strategies.

Assessment Area: Receptive linguistic abilities: phonemic and paralinguistic comprehension

General Procedures: ask the parent or other primary caregiver if the child seems to know when the parent is angry or pleased from the "tone of voice" and whether the child seems to recognize different voices.

Also ask if the child ever seems to understand what is being said to him/her and, if so, specifically what phrases s/he seems to understand. After this information is obtained, observe the parent/caregiver in interaction with the child under semi-structured conditions in which the parent is asked to produce the phrases to which the child is thought to respond appropriately. Observe and record the child's responses to these. Also, look for the following:

a. Does child show distress or otherwise respond differentially if the parent uses an "angry" tone of voice? Does child laugh or smile when parent uses a very pleased or happy tone of voice?

b. If child responds correctly to a phrase as spoken normally, how does s/he respond when:

1) the phrase is spoken in a monotone (with and without gestural cues)?

2) dissimilar consonant phonemes are substituted while maintaining the same extra- and para-linguistic characteristics (e.g., for "show me your nose," substitute "kow tee soor gose")?

3) similar consonant phonemes are substituted (e.g., "Fow nee oor mose" for "show me your nose")?

VIII. Standardized Tests of Comprehension

A. Morphology- test of word forms, tenses, plurality, possessives, comparatives, prefixes and suffixes.

1. Berko's test of English morphology
2. TACL: Test for Audiotory Comprehension of Language
3. Northwestern Syntax Screening Test
4. Gramatic closure subtest ITPA

B. Syntax- word order, phrase structure, transformation

1. Test for Auditory Comprehension of Language

2. Assessment of children's language comprehension
3. Envir. Language Inventory (MacDonald)

C. Semantics - words meaning, vocabulary, concepts (classification relational terms)
1. Peabody Picture Vocabulary Test
2. *The basic concept inventory*
3. Boehm Test of Basic Concept
4. Zimmerman

IX. Observational assessment of vocal/verbal production

The presenter should briefly refer back to the assessment of mutual imitation, vocal frequency and spontaneous imitation and explain that now we will consider the early exhibition of meaning through the expression of verbal utterances.

A. Language sample
1. An audio or video recorded corpus may be recorded while the child is interacting with another individual. This recording may be transcribed (written down verbatim). A variety of analyses can then be computed.
a. mean length of response - the average number of words contained in sequences of vocal behavior (produced by the child) that are bounded by pauses or end in a rising inflection.
b. type token ratio (TTR) - the number of different words produced in the session divided by the number of total words produced in that same session.
c. types of semantic classes produced during the session: a simple tally of the number of utterances denoting recurrence, existance, agent, action, etc. (consult the section of this module on early semantic function).
2. In obtaining a language sample, there are several important things to remember:
a. it is better if the examiner is an observer and the child is interacting with someone with whom s/he is familiar.
b. it is a good idea if at some point during the sampling period, time is reserved during which few demands/requests are issued to the child (questions demanding simple one word responses and yes/no's can skew a sample, particulary TTR & mean length).
c. it is not a particularly good technique to force the child to describe pictures. This type of procedure makes it impossible to examine the child's use of a variety of communicative functions.
d. nursery rhymes & routines should be tallied but not in computation of MLU & TTR.
3. At this point it is appropriate for the presenter to review the most Salient Aspects Blooms (1973) transcription procedure.
4. The measures thus far described represent what we might call distributional measures. That is, they summarize the child's general productive length of utterance, variety, etc. but they don't tell us *specifically* what pragmatic semantic and syntactic deficiencies exist in the child's repertoire. Some additional measures applied to a language should enhance the specificity of assessment.

B. Use of language sample in assessment of early semantic production. McLean et al (1977) have suggested that it should be possible to detect early meaning in children's nonverbal behavior through the exhibition of the following nonvocal behaviors.

Assessment Area: Cognitive Bases for Language: Semantic/Relational Concepts

General Procedures: Use basic procedures for observing nonverbal behavior. To maximize the probability of observing demonstrations of these relations, the environment should contain: objects which belong to the child (his/her own cup, coat, etc.); objects which can be filled and emptied; and objects which are associated with particular locations. In some cases, a parent may be asked to observe the child at home and to record occurrences of each type of behavior.

Specific Behaviors/Abilities of Interest: Does the Child Exhibit:

Target Relations	Examples of Indicative Behaviors
Existence	Child directs attention to object which is moved or makes a sudden sound; seeks out desired objects when they are out of sight
Non-Existence	Shows surprise or disappointment if object is not found where expected; indicates that cup is empty
Rejection	Gesturally or physically rejects a toy, food, or activity not desired
Recurrence	Enjoys repeating actions; indicates desire for more of an object or activity when stopped; enjoys collecting multiple examples of a type of object
Location	When an object is handed to the child, s/he looks to the place where it was previously; goes to seek a desired object in the place where it is usually kept; returns object to place from which it was taken, etc.
Possession	Selects his/her own cup, coat, shoes, etc., when several are available. Hands an object which belongs to another to that person
Agency	Attempts to perform an action performed by another; participates in alternating, role-exchange reciprocal play (e.g., ball rolling)
Objective	Given an object, demonstrates an action typically carried out upon that object (e.g., kicks a ball, pushes a truck, opens a book)

Relevant Published Instruments:

None

Assessment Implications If none of the relations are demonstrated, treatment should initially target just a few basic relations and C.2. target areas should be assessed if not already completed. If a few of the relations are demonstrated, these should serve as the initial targets for language training, while treatment is directed at expanding the child's relational concept base. If all concepts are demonstrated, proceed to next assessment area.

From a Transactional Approach to Early Language Training: Derivation of a Model System. McLean, J. and Snyder, L. U. S. Office of Education, BEH (1977), 202.
From McLean, James and Snyder - McLean, L. K. A Transactional Approach to Early Language Training. Columbus, Ohio: Charles Merrill, 1978. Reprinted by permission.

C. Assessment of interactive strategies
   1. Frequency of vocalization/verbalization
      a. child- the number of vocalizations produced per interval of time
      b. adult- the number of utterances per interval of time directed at the child
   2. Contingency of vocalization/verbalization
      a. child contingent utterances
      b. adult - instances of contingent adult utterances directed to child
         1) respond to and encourage communication
         2) assure joint reference by
            a) directing child's attention to a referent
            b) following the child's visual or gesteral indirection of a referent

c) demonstrate, encourage and provide opportunities for object manipulation, exploration and appropriate use

d) modify utterances directed to the child in accordance with the child's level of functioning by:

1) reducing utterance length
2) reducing complexity
3) parapharasing and repeating
4) exaggerating intonation and stress to highlight keywords
5) using words which are in the child's comprehended vocabulary

3. Utterance content - is generally agreed that severely/profoundly retarded children exhibit less frequent communicative behavior than their normal counterparts. It has also generally been agreed that SMR/PMR children initiate less communicative behavior than their normal or less delayed counterparts. There is some evidence suggesting that the caretakers' input and responses to the child substantially affect the child's emission of initiated and respondent (not in the operant sense) communicative behavior. Consequently, an evaluation of the environment of the child becomes a critical aspect of assessment. McLean and Snyder (1977) have offered an outline to follow in the assessment of the caregivers communicative behavior directed to the child.

Assessment Area: Social Bases for Language: Caregivers' Interactive Strategies

General Procedures: Observation of verbal and nonverbal caregiver behavior in interaction with the child-- preferably in the home or other familiar context.

Specific Behaviors/Abilities of Interest: Does the Caregiver:

a. Respond to and encourage the child's communication, if any?
b. Assure joint reference by either:
   1) directing the child's attention to a referent; or,
   2) following the child's visual or gestural indication of a referent?
c. Verbally "mark" segments of dynamic activities?
d. Demonstrate, encourage and provide opportunities for object manipulation, exploration and appropriate use?
e. Modify utterances directed to the child in accordance with the child's level of functioning by:
   1) reducing length
   2) reducing complexity
   3) paraphrasing and repeating
   4) exaggerating intonation and stress to highlight key words and segments;
   5) use words which are appropriate to the child's level of lexical/semantic development?

Relevant Published Instruments:

None

Assessment implications: If the caregiver does not exhibit most of these behaviors, the teacher/therapist should consider initiating a parent-training program as part of the child's treatment. This may also be extended to include siblings or other caregivers. Factors such as overall family stability and resources, as well as existing vehicles for home-school liaison, will affect the actions taken on the basis of these data.

D. Published data regarding interactional assessment

At this point it is important to review some early interactional behaviors exhibited between adult and child (e.g., mutual imitation, spontaneous motor and vocal imitation). Carefully review the fact that mutual imitation involves a child initiation (C-- A--- C) whereas

spontaneous imitation involves an adult initiation (A--- C). Consequently, children both respond and initiate from early on. Also, it is important to establish that both initiated and responding communicative behavior have been reported prior to the time that Lewis (1951) and Ingram (1974) have reported the onset of dialogue.

McLean et al have proposed a format for the observation and reporting of the child's attempts to respond, initiate and continue an interaction.

Assessment of the social basis of language - socialization
Taken from McLean et al (1977) pg. 204

General Procedures: 1) Use procedures for Observation of Non-Verbal Behavior to observe child in interaction with family members, peer group and teacher(s); 2) Collect interview data from parents or other adults who know the child well.

Specific Behaviors/Abilities of Interest: Does Child Exhibit:

Cooperative or compliant responses to initiations by others:
- Complies with specific requests or commands?
- Joins in a game or other joint activity initiated by another?

Attempts to maintain an interaction when stopped:
- Indicates distress, frustration when interaction is interrupted?
- Actively attempts to maintain interaction?

Attempts to initiate interactions with caregivers? Other adults? Peers?
- For no apparent specific purpose; "just to get attention"?
- For purpose of obtaining needed assistance?
- For purpose of engaging in reciprocal or cooperative play activity?

Shows differential preference for a few persons (e.g., primary caregivers, etc.)?
- Responds cooperatively more often to preferred persons?
- Directs more initiations toward preferred persons?

Relevant Published Instruments:
Balthazar Scales of Adaptive Behavior II. Scales of Social Adaptation (selected items)
Infant Behavior Record (component of the Bayley Scales of Infant Development) (selected items)

Assessment Implications: If child shows none of these indications of socialization, this should be a priority target area for treatment. Also complete assessment for area S.2. If child demonstrates some of these behaviors, treatment should target communication behavior corresponding to the child's demonstrated social development while also targeting further development in this area. If differential preference is exhibited, the preferred person(s) should be involved in treatment to the extent possible.

X. Elicited assessments of production

A. Direct Elicitation Procedure

This device is used in a number of the currently available language intervention programs. In this procedure, vocabulary items are selected apriori by the teacher. The teacher then finds pictures or objects representative of the vocabulary. The teacher presents the objects one at a time asking "what is this?" or "what doing". This technique has generally been designed for use in the assessment of objects and actions. It can be employed, however, in the assessment of a variety of semantic functions. For example (from MacDonald et al 1974).

1. Object production
   Materials: ball, key, car
   Procedure: bring out the object and say "what is this"
2. Object comprehension

Materials: ball, key, car
Procedure: place all objects before child and ask "show me car"

3. Action production
Materials: doll, bowl, spoon
Procedure: make the doll walk, etc. and ask "what did doll do?"

4. Action comprehension
Materials: pictures of girl walking, girl sitting, girl standing
Procedure: place all pictures before child and ask child to show girl sitting.

B. When is the best time to use Elicited Assessment?

1. Miller has suggested that the use of elicited production procedures ". . . is warranted when specific aspects of language are to be analyzed and their frequency of occurrence in naturalistic settings is limited or usual situations do not afford detailed analysis of a specific language behavior."

2. Elicited procedures have been used to assess both comprehension & production of:
   a. questions
   b. negatives
   c. answers to questions
   d. giving information
   e. requesting information
   f. locatives
   g. attributes

examples of each of these techniques are included for the presenter's reference

XI. Imitation: An alternative to elicited assessment of production

A. Assumptions of elicited imitation - the child is required to repeat a list of stimulus words or sentences. According to Miller (1976), the clinician must make the following assumptions in using elicited imitation as an assessment tool.
   1. A certain amount of linguistic processing occurs during repetition tasks.
   2. Repetition tasks involve short term memory.
   3. Word or sentence processing in short term memory is dependent upon the linguistic knowledge available to the child.
   4. If stimulus sentences exceed the child's short term memory span, the child must rely on his/her linguistic knowledge to facilitate memory in order to correctly repeat the sentence.
   5. Since the child's knowledge of the language provides an organizational strategy for short term memory in processing incoming linguistic stimuli, his/her imitative responses should index his/her knowledge of the language, particularly the structural or grammatical components.

B. There is a controversy as to whether these assumptions are met. Consequently, elicited imitation should never be the only procedure administered.

C. What information will elicited imitation yield?
   1. provides information as to the child's:
      a. ability to process sentences in the absence of context
      b. memory ability for sentences
   2. allows comparison between imitation comprehension and production
   3. establishes presence or absence of auditory processing problems

XII. Consideration in the selection of an augmentative communication device

A. Cognitive skills of the child

B. Communicative skill
   1. comprehension
   2. production

C. Motoric skills

D. Social skills

E. Communicative mode of peers and family

XIII. Assessment of manual modes of communication

A. Point & gross gesture

B. Iconic features of sign
C. Motoric features of sign

COMMUNICATION: INTERVENTION

Conclusions Regarding Language Intervention for Young Handicapped Children

1) *Language intervention programs for young, significantly language deficient children* which apply only the dependent and independent variables suggested by either transformational grammar systems or radical behavioral modification systems appear inadequate to the task of attaining *productive* language repertoires for such children.

2) Language intervention programs which would attain adequacy with such children must, instead, apply variables derived from theoretical language modes which include consideration of a child's *cognitive functions and holdings; social functions;* and both the *physical and human elements* and *functions* in the *intervention environment.*

3) Specifically, language intervention programs for such children must target the development of *expanded cognitive bases* for language and specific language targets which represent semantic/linguistic *"maps" of the child's demonstrated existing cognitive holdings.*

4) Similarly, the treatment program for many severely language delayed or deficient young children will need to target the *expansion of social interaction repertoires* and the *development of pre-verbal communication* exchange rituals which can later be mapped linguistically.

5) In designing treatment programs for verbal children, the clinician/teacher must target not only a broad and generative repertoire of linguistic structures, but also, and primarily, a full and functional repertoire of *semantic relationships* or meanings and *pragmatic functions* or intents.

6) In light of the multi-dimensional and pervasive nature of the language intervention model suggested here, it is unrealistic to expect such treatment to be effectively implemented through short, infrequent and isolated "language training" sessions. Rather, such treatment must be generated and implemented in all contexts in which the child has natural opportunities for interaction and communication.

7) A review of existing treatment programs revealed a few which are consonant with some of the implications of this model——particularly for verbal children whose deficits are primarily in the area of linguistic structure or even semantic "mapping." However, for the nonverbal child with deficient social and cognitive bases for language, no existing programs were identified which would be consistent with the intervention model described in this report.

8) In sum, language intervention programs for handicapped children must be designed to better reflect the ethological and transactional variables of normal language development and the child-perspective orientation inherent in that process.

From A Transactional Approach to Early Language Training: Derivation of a Model System. McLean, J. and Snyder, L. U. S. Office of Education, BEH (1977), pp. 315-317. From McLean, J. and Snyder - McLean, L. K. A Transactional Approach to Early Language Training. Columbus, Ohio: Charles Merrill, 1978. Reprinted by permission.

I. Louise Kent: Language Acquisition Program for the Retarded or Multiply Impaired

A. Preverbal section

1. Attending - the attending program sequence consists of simple shaping procedures designed to establish the following behaviors:
   a. sitting still - the terminal criterion for this program sequence is sitting behavior maintained for 30 consecutive seconds. If the child leaves his/her seat before 30 seconds has passed, the skill is trained.
   b. elimination of interfering behaviors - this task involves the use of Azrin, Kaplan and Foxx's Autism reversal procedures.
      * trainer exposes child to several tasks
      * once a preferred task is found the child is reinforced for doing it.
      * the trainer then begins reversal procedures for stereotyped behaviors paired with reinforcement for appropriate object manipulation. The clinician stands behind the child and requires him/her to engage in behavior incompatible with the stereotype. (see Kent, pg. 21)
   c. looking at objects - terminal behavior in the sequence requires child to look at five objects widely spaced on table. If trainer points to an object while saying look at this, the child must look at the object.
   d. pretrial eye contact - very similar to looking at objects. The same stimulus array is used. The clinician pauses slightly longer between trails to see if the child will re-establish eye contact.

2. Motor imitation - ten behaviors including pointing to object on table, point to eye, point to nose, etc. The child must learn to imitate these behaviors.

B. Verbal section

1. Pointing to body parts named - child is required to point and touch the parts of the body named by the trainer (e.g., "show me Dan's ear").

2. Performing actions

sit down	stand up	taught first as imitative behaviors and then as verbal instruction following.
fold your hands	comb your hair	
brush your teeth	wipe your nose	
close your eyes	wash your ears	

3. Pointing to objects named - child is required to point to objects named by the clinician.

baby	car	shoe
doll	comb	bell
ball	hat	keys

4. Finding concealed objects named - eight objects are spread on a table concealed under cloths. Clinician shows the child the objects and covers item. The clinician then tells the child to find the _____.

5. Pointing to room parts (same procedure as naming objects)

C. Receptive expansion-phase I

1. Performance of action named: body parts - the child learns to respond differentially to commands requiring the child's action upon a body part(s). e.g., wash your ears; wash your hands, face; brush your hair.

2. Performance of action named: objects - the child learns to respond differentially to the following commands requiring the child to act upon objects. e.g., push the car; rock the baby; throw the ball; ring the bell.

3. Finding concealed objects named: two boxes - the child learns to search for the object named in one of two boxes. Clinician shows object to child, puts object in box with foil box present and asks the child to find the object.

4. Performance of action named: room parts - the child learns to respond differentially to commands involving his/her actions upon objects with respect to room parts. e.g., put the keys on the chair; put the baby on the chair; open the door; mop the floor, etc.

D. Receptive expansion-phase II

"This phase introduces a variety of tasks involving simple receptive expansions that are assumed to be within the grasp of the children . . . and assumed to be likely to set the stage for the occurrence of two word responses in the future." Kent (1974)

1. Discriminating possession - the child is taught to respond differentially to commands distinguishing possessing.
   e.g.,
   show me Tommy's nose
   show me baby's nose

2. Placing objects in prepositional relationship to room parts - eight objects are paired in various ways with four room parts (three prepositions in, on and under are used).
   e.g.,
   put the_____ in the box
   put the_____ on the chair
   put the_____ under the chair

3. Giving related object pairs - the child is taught to comply to two component commands using vocabulary words already established in reception procedures. e.g., given me the _____ and the_____ .

comb-brush	brush-comb
shoe-sock	sock-shoe
hat-coat	coat-hat

4. Finding concealed object pairs: toy box search - the same objects used in other concealed object tasks are also used here. Six objects are placed in a box and the lid is replaced. The interventionist then says "give me the_____ and the_____." The child must remove the lid, retrieve the two objects and give them to the interventionist.

5. Color sorting - procedures are self-explanatory. Colors used are: red, green, blue, yellow, black, white, purple, orange, brown.

E. Receptive expansion-phase III

1. Verb & adverbial place - where commands
   "In this part the child is taught to follow a variety of new commands which require him/her to move his/her body through space. e.g., get in the box; stand up; walk around the circle."

2. Vocabulary expansion & nouns - an additional repertoire of nouns is established through use of procedures described earlier to establish noun identification.

3. Sorting big - little

4. Pointing to color named - the child learns to point to the color that the interventionist names. In addition to the color to be pointed to there are eight foils.

The remainder of program steps in the receptive phase of programming, stress number identification as well as the establishment and use of new vocabulary items.

F. Verbal section expressive

"The purpose of this phase is to teach the child to differentially imitate at least 10 of the 20 basic vocabulary items used in the receptive phase of programming."

1. Vocal imitation - the child is taught to imitate a variety of sounds not necessarily established in his/her repertoire. (refer to Kent pg. 57-59)

2. Naming body parts - the child is taught to name body parts that s/he already identifies. e.g., "what's this_____?"

3. Naming objects - same procedure described above is used.

4. Naming concealed objects - the interventionist shows object to the child. S/he then places it in the box and asks the child what it is.

5. Naming room parts

G. Expressive expansion-phase I

"The purpose of this phase is to teach the child to respond to question forms more complex than the simple what is this? The child is taught to mand actions of the trainer."

1. Discriminating possession: whose body parts - the child is taught to identify objects as either belonging to himself/herself or belonging to a baby (toy doll). Trainer points to one of doll's body parts and asks "whose_____is this?"

2. Naming object in prepositional relationship to room part - the child is taught to name objects when the clinician positions the objects and asks:
   * what is in the box?
   * what is on the chair?
   * what is on the floor?
   * what is on the table?

3. Naming room part in prepositional relationship to object - the child is taught to name room parts in response to "where is the_____?"

4. Manding actions: verb - noun - the child is taught to say push & throw and get the trainer to respond appropriately.

H. Expressive expansion - phase II

1. Naming colors - "what color is this?"

2. Naming concealed colors

3. Naming two objects - child is required to name two objects in series in either order in response to the question "what is in the box?"

4. Naming object and room part in prepositional relationship - the child is required to produce a two word response when the trainer asks "where is the_____?" Child produces

comb-table, etc.
The remainder of procedures involve the expansion of verbal vocabulary, expanding lengths of mands that the child uses, counting disappearing objects and chaining the name of the color plus object.

II. Bricker and Bricker Language Program

A. Prerequisite processes

1. Attending skills - "Any behavior or constellation of behaviors that will facilitate the acquisition of a new response or modification of an existing response."
   a. sit in chair - this program suggests placing the child at a table for short periods of time and playing imitation games or placing toys on the table for the child to manipulate for short periods of time.

2. Look at teacher - "Take child's face between your hands and direct his/her face towards yours. Say "look at me." Gradually over trials prompting is reduced.

3. Work on task - "Having the child sit on a chair or on the floor and interact appropriately with the teacher focusing on some educationally relevant task." In this task some behavior which is reinforcing but relatively simple for the child is chosen.
   a. take child to seat
   b. tell child to look at you
   c. say "do this"
   d. gradually increase the time that the child will spend on task

4. Imitation training
   a. increasing vocalization - the child is reinforced for increasing the frequency with which s/he produces throat and mouth noises.
      * when the child vocalizes, the adult imitates the child. (Bricker and Bricker note that roughhousing seems to facilitate vocalizations.)
      * when the child's vocalizations have increased substantially, the child and clinician are ready to advance to the next phase of training.
   b. gross motor imitation
      1) early imitation
         * the child is given substantial opportunities to watch the interventionist copy his/her actions.
         * if the child does not imitate the adult's imitation, the child receives physical prompts.
      2) gross motor imitation of familiar actions
         * the child learns to imitate the interventionist after the interventionist initiates the activity.

Strategy 1	Strategy 2	Strategy 3
The clinician continues to copy the child's actions after s/he has initiated as was done in a.	The clinician physically prompts the child's imitation following demonstration.	The clinician demonstrates an action with an object s/he is fairly certain the child will imitate.

      3) gross motor imitation of unfamiliar actions (self-explanatory).
   c. sound imitation (child initiated) - the child is taught the game of vocal chaining. child vocalizes----- adult imitates----- child imitates adult.
   d. sound imitation (model-initiated) - the child is taught to approximate a vocal production of the sound initiated by the clinician. In this procedure the time between

the child's production and the adult's imitation is increased. Eventually the child will come to imitate the adult.

e. speech sound imitation - the child exhibits the same type of imitative skills established in step No. 4. In this training step, however, the child is imitating new sounds (sounds are introduced one at a time).

5. Early word recognition
Bricker & Bricker's program sequence stresses that one step need not necessarily be completed before the child is advanced to a different step. The imitation sequence and early word recognition sequence are exemplary of this programming feature. In early word recognition, the child is brought under the control of simple words and phrases which occur often in his/her environment. The child is taught to respond appropriately to several words and commands.
Hi ------ child waves
Night night -------- child goes to bed
I'm gonna tickle your ----- child smiles or laughs
Time for snack ------- child moves to snack table

6. Functional use training
The purpose of this program is to assist the child in establishing a relationship between the sounds s/he hears in his/her environment with the particular action and object in which s/he is engaged.

7. Establishment of different action patterns
The child is taught several different action patterns which are used with different objects. Four or five objects are selected that the child might be likely to encounter. The clinician models simple actions which the objects can be made to perform. Gradually, the models are faded.

B. Linguistic processes

1. Verbal imitation of component sounds can be established simultaneously with G. Sounds which are believed to be simple for the child to produce are chosen and presented in isolation.

2. Verbal imitation of words (nouns) (self-explanatory)

3. Comprehension of nouns

4. Comprehension of verbs

5. Production of verbs

6. Training two word phrases
The child learns to use word combinations to talk about relations between agents (nouns), objects (nouns), and actions (verbs) by using two word phrases.
   a. verbal imitation of two word utterances - the child learns to imitate two word agent-action and action-object phrases. The use of expansion is recommended to establish these appropriate imitated sequences.
   Teacher: ok, who wants a cookie? *Child:* cookie *Teacher:* cookie, want cookie, say want cookie.
   b. comprehension of two word phrases

III. Horstmeirer, D. and MacDonald, J. Ready, Set, Go-Talk to Me

A handbook for the teaching of prelanguage and early language skills designed for parents and professionals

A. Preliminary skills training packet

1. Eye contact with objects
   In this sequence the child learns to locate an object that has been placed in a box before him/her.

2. Eye contact with people (self-explanatory)

3. Sitting
   The child is taught to sit "reasonably" quiet for 30-50 seconds.

4. On task behavior
   In this sequence, any behavior other than sitting and eye contact that interferes with training is decelerated.

B. Functional play
Informal ways to stimulate play. These activities consist of modeling activities that involve the child's use of his/her five senses. Additionally this prescriptive packet stresses reinforcement of the child's appropriate patterns of play.

1. Play with toys - child is prompted to perform an action on a toy. e.g., *Material:* truck, car, bus *Activity:* push

2. Play with household objects - child is prompted to perform appropriate action. e.g., *Material:* comb, brush *Action:* comb hair

3. Play with combinations of objects - e.g., *Material:* spoon & bowl *Activity:* stir

4. Application to the environment
   a. talk in short clear sentences about ongoing activities
   b. physically assist child in exploration and appropriate use of objects

C. Motor imitation
This sequence of training is not unlike previous sequences of motor imitation with the exception that the content is more clearly specified and includes:

1. Imitations using toys and other objects. e.g., *Action:* push the car *Material:* toy car

2. Imitation of physical actions. e.g., clap your hands. At the completion of each training session patticake routines, finger plays are elicited. Generalization to environment - the goal in environmental generalizations is to elicit three different motor imitations in three different situations.

D. Receptive (understanding) language
Identifying Objects and Pictures - given the object to be selected and a foil, the child is taught to identify the item named by the trainer. After items are initially established in the child's repertoire, the trainer moves to game like applications involving selection of puzzle pieces when a given object is named.

E. Receptive (understanding) language II action words
In this sequence the same techniques are utilized that were utilized in the establishment of early

noun vocabulary. In this sequence, however, the child manipulates an object into the named action.

F. Following simple directions

This sequence is an appendix to the other receptive programs. Directions are important to the safety of the child. This sequence can be taught as soon as the child can move part of the way across a room and show signs of paying attention to a human voice.

Directions are taught utilizing a reinforcement paradigm paired with the fading of prompts. Content for training includes:

* come here
* stop
* no or don't touch
* fast or quickly

G. Sound imitation

This sequence of programming is designed to teach the child to imitate a variety of sounds that have been paired with a meaningful object.

H. Single word imitation

In this sequence, the child learns that when given a model such as placement of doll in a car paired with the verbal stimulus such as "sit" s/he will imitate the appropriate word.

1. Socially useful word training - "Socially useful words are usually taught during daily activities, not in language sessions. The following items are taught via imitation during individual sessions as the appropriate SD arises. e.g., more, gimme, no, all gone, stop, oh oh, hi, bye, there.

I. Beginning social conversation (two or more word phrases)

This section attempts to establish multiword utterances via formal sessions as well as during informal gamelike situations.

Content:

agent + action
action + object] two word

agent + action + object
action + object + location
agent + action + location
x - location phrase] three word

IV. Guess, Sailor and Baer Language Intervention

A. Imitation training

Guess, Sailor and Baer are investigating the facilitating effect of three different approaches in the establishment of early communicative behavior.

1. Concurrent motor and vocal - in this training procedure the child learns motor imitation as well as vocal imitation during the same programming sequence. Procedures used involve simple shaping and reinforcement. This technique assumes that vocal imitation parallels motor imitation as generalized imitation is developed.

2. Consecutive motor and vocal - in this training procedure, the establishment of nonvocal motor imitations precedes bringing the child's vocal behavior under control. In this technique it is assumed that motor imitations are particularly useful in providing simple cases for imitation training.

3. Direct vocal - this training procedure concentrates solely on the establishment of vocal imitative behavior. This procedure operates under the belief that the development of motor imitations need not occur in order to train vocal imitations.

B. Receptive and expressive labeling of persons and things.

1. Following are the steps involved:

step 1.

Expressive label - the terminal behavior in this program sequence requires that upon the presentation of an object, the child will spontaneously label the object.

step 2.

Receptive labeling - given an object array, the child learns to point to the object named by the trainer.

step 3.

Yes/no used in object identification - in this procedure the child learns to respond appropriately by providing a yes or no response to the question. Is this a _____? Persons and things representing the stimulus items include both persons and objects for which names have been trained and persons and objects whose names have not yet been trained.

step 4.

Alternate yes/no - this procedure is similar to the previous step. In this step, however, reinforcers are used as well as negative reinforcers; e.g., Do you want a cookie? (yes), Do you want mustard? (no). Step 4 teaches no as nonexistant. Step 4a teaches training acceptance/rejection will generalize to the establishment of existance/nonexistance.

step 5.

In this sequence the child is taught to demand/request an object of interest using the object's name.

step 6-7.

In this program sequence the child is taught that if you don't know the label for an object, it is not appropriate to attempt to label it.

step 8. In this program sequence, the child is taught that when one is shown an object for which the label is unknown, it is appropriate to ask "what's that?" When one does know the label, it is appropriate to supply it.

These program steps are commercially available. The remainder are in experimental form.

The same procedures used in the preceding steps establish first the independent use of an action descriptor both productively and receptively. Subsequently the child is taught to distinguish between (I) vs. (you) in use of words to talk about actions with persons and things The remaining program sequences described by Guess, Sailor and Baer establish the productive and receptive use of possession, color, size and relation.

Presenter should use McLean et al pages 267-292 in formulating presentation of strengths and weaknesses of existing programs.

This section is specifically left to organization at the descretion of the presenter because of the individual changes necessary dependent upon the orientation of the presenter.

V. Analysis of Current Programs from Transactional Model Perspectives

A review of currently available programs will reveal the fact that many of these programs went through their *initial* developmental phases before the semantic data was well-known and all of them predated the pragmatic data of the past two years. The degree to which various of these current programs might reflect the variables which are represented in the transactional model are determined by three things: 1) the most basic theoretical bases from which they emanate; 2) their relative time of development in terms of the availability of certain of the more recent theories and data; and 3) their relative receptivity to evolutionary change.

These three factors have had such highly differential effects on various programs that it is impossible to discuss them in any collective way. Instead, each program must be considered within its own specific history if it is to be considered in any fair and productive way. Before initiating these considerations of currently available programs, we would like to specify the perspectives which will direct our discussion of them.

1) We will only be discussing *major* published programs;

2) We will only be discussing programs which have been directed by their authors to young severely communicatively deficient children;

3) We will *not be judging* such programs; rather, we will be discussing them in terms of the perspectives reflected in the transactional model we have derived from current literature;

4) Within this discussion, we will indicate those areas in which we think there is deviance from what the transactional model indicates, thus, we will be identifying what we see in these programs as *contra-indications* of the perspectives explicit in the transactional model.

It is possible for our discussion of such contra-indications to the transactional model to be considered as criticisms of these programs and, in a broad sense perhaps they are. We would prefer to view our discussions of existing programs as being objective evaluations of their deviance from our admittedly biased view of a model for such programs. Thus, for those who can subscribe to the transactional view as a viable base for generating intervention programs, our evaluation of current programs will be constructive criticism. For those who must reject the transactional model, our evaluation of other programs in comparison to such a model can be dismissed as unwarranted and biased hogwash. You simply pay your money and take your choice!

A. MacDonald's current program The work of MacDonald and his colleagues (MacDonald, 1976; MacDonald & Blott, 1974; MacDonald, Blott, Gordan, Spiegel & Hartmann, 1974; MacDonald & Nickols, 1974) culminates in a semantically based program directed specifically to young, severely delayed children. As the most recently developed of such programs, MacDonald's work manifests the most consistent reflection of the semantic perspectives. This program, for example, reflects not only *semantic content* targets, but targets such content in consistently *semantic realization* rules at least as they are suggested by Schlesinger's (1971, 1974) work. Thus, MacDonald, et al., target action sequences as Agent-Action-Object word-order structures.

MacDonald, et al., provide two assessment inventories which are exemplary. The first, the *Environmental Prelanguage Battery* (EPB) assesses various elements which are suggested important to the child's becoming a language learner. As such, it attends to both the social and cognitive underpinnings of the language acquisition process as well as the more traditional behavioral targets of imitative responsiveness in both the motor and speech domains. The second assessment instrument is

From A Transactional Approach to Early Language Training: Derivation of a Model System. McLean, J. and Snyder, L. U.S. Office of Education, BEH (1977) pp. 271-290.

From McLean, J. and Snyder-McLean, L. K. A Transactional Approach to Early Language Training. Columbus, Ohio: Charles Merrill, 1978. Reprinted by permission.

prescriptive for the more formal language targets of the program, thus, the *Environmental Language Inventory* (ELI) is a semantically based instrument. It samples language across several evoking contexts and MacDonald (1976) reports high correlations with the ELI-evoked findings and the semantic rules expressed in free speech samples.

The MacDonald program is so strongly reflective of the cognitive bases of language that it anticipated Bruner's (1975) suggestions about the action-sequence and its role in language learning. As a consequence, this program stresses a context of social-play interaction between mother/teachers and children as the context for language learning. To accomplish and support this interactive context, MacDonald and his colleagues have designed what appear to be most excellent examples of the "instrumental teaching contexts" we have referred to previously. MacDonald has developed a multi-stationed classroom in which language realization targets are targeted in an interactive milieu. In this arrangement, targeted structures are made to occur at high rates and within contexts in which their communicative function(s) are salient and appropriate. In this sense, even though MacDonald's work predated the most recent pragmatic perspectives, his attention to the cognitive and social bases of language have led to the development of highly relevant and dynamic interactive events in which children can "talk about" things and events for some purpose. It would seem that such a context would have a high probability of evoking most pragmatic functions. It will be helpful however, when and/or if such formal pragmatic categories are made explicit as specific targets in this program.

Above all things, MacDonald's programming innovations in both content and context reflect the tremendous facilitation of a move to look at language from the standpoint of the *child* as opposed to looking at it from an adult-centered theoretical base.

All in all, it would appear to us that MacDonald's program reflects more of the transactional elements than any of the other programs except, perhaps, that of Miller and Yoder which we will be discussing next. This program does, however, need considerably more extension into areas of more detailed pragmatic classes and, thus, more attention to structures other than the simple action relationships. In addition, we think that MacDonald's program, by virtue of its time of development, does not offer the needed formal attention to the effects of the *referencing* strategy on structures produced *in situ*. Based, as it is, on a strong commitment to semantics and psychological reality, we would expect this program to remain accommodating to new perspectives and, thus, to show considerable evolution in its form over the next few years. This program, in other words, appears to be highly viable at this point in time.

B. Miller and Yoder's program The work of Miller and Yoder (1972, 1974) has produced a rich, developmental exposition of semantic-based intervention programming. This program's entry requirements specify a child who is on the language continuum at least at the level of using a few single words. From this point, Miller and Yoder's program carries them through a program modeled after Bloom's (1970) Semantic Relational Functions, Substantive Functions, Functional Relationships, and Semantic Relationships. This program culminates, structurally, in three- and/or four- word relational structures based on the basic agent-action-object sequence and the expansion of the noun phrases within these sequences.

Miller and Yoder's program reflects a little schizophrenia in its selection of terminology to describe its structural targets. Since it has maintained its basic representation of Bloom's perspectives, it often specifies its target in terms of grammatical structures rather than semantic case-structure. Frankly, it is difficult to assess the overall effects of this inconsistency of perspective. This program communicates well to the teacher, but it does seem to lack an internal consistency in this domain.

Like MacDonald's program, that of Miller and Yoder also omits any consideration of the *referencing* strategies we have found so compelling. Affecting realization structure as much as they do, this omission in current versions seems an important deviance from the transactional model directives. We will note, that the referencing perspectives were available at the time both Miller and Yoder and MacDonald's Programs were developed. It would appear that they were not processed within their respective program development activities, however.

Miller and Yoder's program also predated the full thrust of the so-called pragmatic perspectives and, therefore, do not reflect them in the same form as does the transformational model. Nevertheless, like MacDonald, Miller and Yoder are so sensitive to the basic social and cognitive functions that there is much attention to various types of "mapping" functions within language and the interactive learning of language. Thus, there are good representations of these issues. In addition, this program's overall sensitivity to the "communication" function of language brings it to pragmatic functions of some sophistication even in the absence of the more compelling suggestions of Halliday (1975) and others which have appeared on this topic.

All in all, then, Miller and Yoder's program comes very close to the demands of a transactional model. It is shy in the area of providing a full representation of the effect of referencing strategies on structure and, as we have indicated, a full representation of specific pragmatic categories. It is also slightly disconcerting in that it is not consistent in its strategy for specifying realization forms. It would appear that this problem and that of MacDonald's failure to fully expand the repertoire of his semantic strucutres are really the product of both programs' void in their consideration of *referencing's* role in determining structure.

Like MacDonald's work, Miller and Yoder's program appears to be highly viable at this point. Both are still working along complementary lines of research and clinical perspectives and we would expect these to be reflected in further updates of their views in program form.

C. Stremel-Waryas' program The detailed program offered by Stremel and Waryas (1974) is somewhat enigmatic from our perspectives. On its face-value, this program is most basically a syntax teaching program. Obviously, from the views we have expressed in sections previously, we are not accepting of syntactic structure as a good representation of a child's reality in language and, thus, not a good form from which to structure response targets for young handicapped children.

From both personal experience and from the published materials, however, we know Stremel-Campbell to be an excellent and experienced clinician whose procedures reflect a strong predisposition to teach children to "talk about" things and, as a consequence, demonstrate a semantic and referencing perspective in her presentations of this program.

Stremel and Waryas (1974) state that they use syntactic structure only to be able to describe the linguistic forms necessary to express semantic relationships and, indeed, when one examines their content and control sequence, one finds them stated in essentially semantic terms. In a sense, Stremel and Waryas are similar to Yoder and Miller in that they specify their targets in syntactic form but seem to generate them from semantic bases.

Even with this expressed semantic base for these structures, however, the syntactic target forms evoke in us that problem of internal consistency that we also see to a lesser degree in Miller and Yoder's program. The specific effects of this inconsistency is visible in Stremel and Waryas' program in that the sequence of training seems very much dominated by expansion along a syntactic line rather than a semantic line *per se.* Just as an example, we find inflectional endings (e.g., -ing) and wh-question forms occuring extremely early in this program. While we appreciate the possible pragmatic value of such forms as wh- questions, our previously stated preference is *not* to target these necessarily in their most refined syntactic form. Similarly, a structural grammar view seems also to lead Stremel and Waryas to an early attention to pronoun forms and, even, articles. Perhaps it is that our perspectives about the population of young severely communicatively delayed children and Stremel and Waryas' perspectives about their target population are at odds here; but it would appear to us that there are many semantic targets which are more highly desirable (functional) than those involving systems morphemes like articles and case-controlled pronoun forms of extreme complexity (see Waryas, 1973). Our point here being, that even though this program is stated to be dominated by semantic realizations through syntax, the syntactic developmental sequence applied seems to negate this posture. Clearly, the *transformational grammar system* leads this program even though its procedures and general training contexts have strong reflections of semantic instincts on the part of the programmers.

Overall, the Stremel and Waryas program has much to commend. It is highly systematic and its teaching contexts seem excellent. (We might suggest that those of you who have not seen it, might order the film *Perspectives on Language* by Ruder and Stremel which demonstrates this program. It is available through the Bureau of Child Research, University of Kansas, Lawrence.) We cannot feel at this time, however, that this program offers a full exploitation of the semantic perspectives as they are now perceived. Naturally, because of its time of development, it also lacks adequate representation of the pragmatic perspectives basic to the transactional model. Like the other programs reviewed to this point, the Stremel and Waryas program also lacks any explicit reflection of the *referencing* strategies in determining structure. Having watched the dynamic contexts offered within Stremel's training, however, I think referencing strategies are often informally evoked and allowed.

Like the other programs reviewed to this point, Stremel and Waryas' program still appears to be viable. In fact, a new chapter on their perspectives is forthcoming (Waryas & Stremel-Campbell, in press) and promises some added consideration to both semantic realization forms and pragmatic functions.

D. Guess, Sailor and Baer's program This program represents the "purest" applications of the functional analysis of behavior approaches to severely communicatively deficient persons (Guess, Sailor & Baer, 1974; Guess, Sailor, Keogh & Baer, 1975). In its analysis of the functions of language, this program identifies *reference* and *control* (of environment) as primary and generates its targets in this perspective. In this sense, these program ideas represent the best current representation of strictly pragmatic-type analysis. Approaching these functions from the behavioral point-of-view, however, results in perspectives which show some subtle but highly significant deviations from the pragmatic-functions which have been identified by those who have been processing language *per se* (e.g., Dore, 1975; Halliday, 1975). Since such formal pragmatic views were not available during the development of Guess, Sailor and Baer's program(s), it cannot be ascertained whether or not these recently emphasized views *would* have been incorporated in these programs. Interestingly, however, the *basis* of the later work in pragmatics has long been available (DeLaguna's work was first published in 1927) but has never been formally considered in any behavioral approaches that we are familiar with.

The primary differences between the current behavioral representations of function and those identified by the pragmatic-linguistic views lie in the generalization we have made previously in this report——namely, that behavioral views continue to differentiate only one class of language responses as "mands" (Skinner, 1957) which act upon the environment to evoke or specify reinforcing consequences. In behavioral perspectives these manded reinforcing consequences are most likely to be identified from among so-called "primary" reinforcers (e.g., food, water, etc.) and/or high-probability conditioned reinforcers (e.g., toys, preferred activities). In the more recently emphasized views of pragmatic functions, the reinforcers for communicative utterances are considered in much broader social perspectives (e.g., secure help, secure interaction, attain joint reference, attain interpersonal response, etc.). Thus, current pragmatic perceptions extend the basic "mand" function to *all* human communicative efforts. These say, in effect, human communication attempts are all mands for human response in the broadest sense and, further, that the reinforcers for language must be viewed within these broader views of language as a regulator of *social interaction* and *cooperation.*

Thus, while there is nothing in the current behavioral perspectives about language functions that we would *deny,* there are, we think, serious deficiencies in the *scope* of functions specifically identified to this point in behavioral programs. In a very real way, the transactional model provides an *extension* of functional analysis views, *not* a refutation of them.

On another philosophical front, the current behavioral construct of *reference* manifest in Guess, Sailor and Baer's (1974) work is also somewhat constrained when compared to this construct as it is represented in the transactional model. Again, the difference seems to be one only of degree and scope, not one of basic contradiction.

It is axiomatic that the behaviorist cannot consider "inside events" when developing his/her constructs. In other words, the behaviorist considers processes within the mind or covert psychological processes of a person to be unquantifiable and, thus, unusable in developing their approaches. Consistent with this constraint, current behavioral language programs do not consider the structure or the basic content of a child's *cognitive* processes in language. As a result, Guess, Sailor and Baer's programming toward referencing (labeling) considers only the quantifiable aspects of their controlling antecedent events, the differential responses, and the consequential events in developing referential skill responses. As such, they eschew any consideration of developmental cognitive factors in their structural targets. Similarly, they do not consider possible cognitive prerequisites to the content of their targeted response forms. As such, then, this program reflects no consideration of a "psychological reality" for language which is beyond their specific manipulations of functional variables. Such a view essentially precludes any representation of a cognitive-semantic perspective in programming. With such apriori exclusions incumbent on their programming approaches, behaviorists must necessarily ignore the overall cognitive based referencing construct as outlined by Olson (1970); the mapping construct; the presuppositions which would appear to underlie pragmatic functions; and the semantic-based structural forms which would appear to be a product of all of these psychological processes. In the face of such theoretical preemptions, we cannot consider that the language programs produced only from behavioral perspectives can be considered complete in any sense. It is paradoxical that the radical behaviorist, particularly, has, to this point at least, seemed to reject so many possible "functional" variables. As in the case of many programs, however, we must again note that many of these theoretical and empirical perspectives were not available to people like Guess, Sailor and Baer at the time their current programs took their form. It will be most interesting to observe any modifications that might be forthcoming in the future. The pragmatic perspectives particularly, would appear most productive for their further behavioral analysis. As the other programs discussed to this point, it would appear that these authors will continue to be productive in this area for some time to come and we would fully expect some evolutionary changes to be forthcoming from them in this area.

As we have stated previously, there is much credit due the behaviorists, in general, and people like Guess, Sailor and Baer in particular. Without their constant efforts, there would probably have been very little programming for the severely deficient populations that they have been working with. It is a further fact of important note that the behavioral programs have been the only language programs which have been committed to attempts to understand and insure *communicative function.* You must recall that the grammarians have never considered this facet of language. It is, therefore, particularly ironic that the behaviorists are at some deviance now from the rather compelling positions which are now related to the function of communication. The problem of an appropriate consideration of the psychological dimensions of language and language usage which happen "inside the head" obviously have made for this ironic happening. It will be most interesting (and we're sure instructional) to see how the first-line behaviorists deal with this basic confrontation on communication function.

E. Kent's program The *Language Acquisition Program for the Severely Retarded* (Kent, 1974; Kent with Klein, Falk & Guenther, 1972) is a behavioral program in that its procedures are all systematic and drawn from functional analysis of behavior principles (Skinner, 1953; Holland & Skinner, 1961). This program is different from that of Guess, Sailor and Baer's, however, in that it seems to draw its targets and procedures more from a "clinical" view than a strictly theoretical one. In doing so, Kent and her colleagues tended to end up with targets which compare rather favorably with the types of targets generated on the basis of the cognitive-semantic data which came along some time *after* the basic elements of this program had already been developed. In this sense, Kent's program, based as it is on some intensive experimental experience with retarded children, seems to offer some proforma validation of some of the suggestions which have been generated from the application of the semantic data.

For example, Kent's targets reflect a strong representation of both the action sequence which Bruner's (1975) work suggests to be most important and it targets the action-attributes as semantic features underlying early lexicon as Nelson's (1974) work would suggest. The fact that Kent's program also targets the labeling of commonly experienced objects and actions from the environment of her

subjects also reflects the trends suggested by the current cognitive views. It seems clear that Kent, like other clinicians, had clear intuitive appreciation that language requires some "reality" to children in the form of existing knowledge and referential characteristics.

Kent's program is also notable for its procedural commitment to a *Receptive Phase* in her program in which she sought accurate behavioral indicators of language comprehension. We have not discussed the basic expressive-receptive dichotomy in this section because we covered it in such depth in Chapter 3. It might be well here, however, to restate our positions in a clinical perspective. Basically, we agree with MacNamara's (1972) position that children come to language learning through the process of matching up receptive language patterns with their already present knowledge about entities and relationships in their environment. As indicated in previous discussion, we *don't* think that there is, necessarily, a one-to-one relationship between receptive acquisition and expressive usage. Rather, although we accept a receptive primacy, we view eventual expressive productions as coming from another set of variables, e.g., pragmatic intent and referencing strategies. Much as Guess and Baer's (1973) demonstration of the independent relationship between receptive and expressive responses, we see the two processes as under quite different controls but highly related. If you will recall Figure 12 in Chapter 4, which presents our overall model(s), schematizes the way we perceive the realization processes in these two modalities.

At any rate, Kent's program contains a highly systematic receptive phase which precedes her move toward attaining expressive realization of her targets and we find this appealing, particularly because it is made to occur in such dynamic contexts. Although Kent's program is not guided by the systematized consideration of the cognitive-semantic categories that are found in later developed programs like those of Miller and Yoder (1972, 1974) and/or MacDonald, et al. (1976, 1974), her targets, overall, offer a fairly good representation of the semantic categories which are related to actions and referential attributes, including relational attributes.

As we have stated previously, we also are appreciative of the contexts Kent structures for the playing of many "language games." Her missing objects, part/whole, and contextually controlled presentation of target-objects seem highly productive. The fact that she structures these so highly for receptive language games makes them highly useful because, often, such contexts and procedures are difficult to design.

All in all, Kent's program seems to us extremely useful and well-designed, particularly considering the relative time of its development. We would suggest, however, that Kent's basic program can be significantly enhanced by careful integration of many of the missing semantic relations and, certainly, by consideration of new pragmatic intent constructs. We would also think that Kent's realization structures might be modified somewhat by more sensitivity to the referencing strategy construct. Most of her structures are, to our way of thinking, perhaps too structurally generated for a young population.

If one approaches Kent's program armed with the supplemental perspectives in semantics, cognition and social-functions of communication, we would think it will prove highly productive. Interestingly, this is one of the programs for which we have no firm basis for expecting revisions in the fairly near future. Kent has left her institutional research setting and, although we are sure she will remain productive in the field of language for the handicapped, we cannot be sure that she will ever return to it at the levels necessary to produce significant evolutionary changes in her programs. We certainly can hope!

F. Brickers' program The Brickers' (Bricker, D., Dennison & Bricker, W., 1976; Bricker & Bricker, 1970, 1974; Bricker, Dennison, Watson & Vincent-Smith, 1973; Bricker, W., 1972) overall approach to language is an interesting one. It differs from all others in that it does not appear to us to be a program for generating a specific *language repertoire* so much as it is a program for generating a *class of behavior called language.* Brickers' work seems classifiable as truly a "psychological approach" to language behavior. As such, it covers more ground and involves more process variables than any other language program directed to young handicapped children.

Most of you will know that Brickers were the first to incorporate considerations of the child's sensorimotor intelligence and schemata into a language program. They were, therefore, the first people to actually apply the "mapping construct" which has now come to dominate the more recent language programs. As a result of their conviction that language had to have a cognitive base, the Brickers taught children the functional use of objects (e.g., drink cup) prior to "mapping" that event. They also worked diligently on discrimination programs in which children differentiated among various objects on the basis of any of their several attributes and/or properties. All of this was directed by their conviction that children had to know something before they talked about it; a position which has now become the rule.

The Brickers' work has also always reflected a basically developmental perspective in which prerequisites are well considered. In this developmental perspective, they have attended to all aspects of the child's system from his/her basic hearing sense through babbling, cognitive discriminations, receptive language, and on to expressive language. They suggest work on gross motor imitation of a child and provide elaborate programs for imitative shaping of phonological approximations of the target words in their program.

In their latest program (D. Bricker, Dennison & W. Bricker, 1976) they target the basic semantic structure associated with the action-sequence (i.e., agent-action-object) and, as such, have generally moved with the so-called "semantic revolution." They also reflect a good awareness of semantic intent as reflective of cognitive bases as might be expected from their previous strong Piagetian applications in language. Similarly, their representation of the action-sequence reflects their early awareness of "functional use" categories between verbs and object nouns.

The Brickers' programs have always manifested a strong assessment dimension which reflected their developmental view. Although well-identified as overall "behaviorists" in their procedures, they have consistently remained eclectic in their ability to accept other theoretical inputs into the substance of their programming efforts. Thus, their programs move from nonverbal, sensorimotor levels to receptive levels and thence to speech realizations, and they suggest assessments at these various levels as requisites for moving to other levels. The Brickers' programs have also always reflected at least a gross interactional approach in that they have been carried within an overall preschool classroom environment where all of the developmental activities have been represented. They do carry out a lot of one-to-one sessions (or small group sessions) within the overall classroom context, particularly on the imitation and discrimination activities.

As we list the various activities of the Brickers' programs, it is obvious that they are well-representing of most of the elements offered in the basic cognitive-semantic perspectives. As a Gestalt, however, the Brickers' programs do not approach the overall "feel" of other language programs. Perhaps this should tell us something important. First, the Brickers have worked directly with developmentally delayed children in developing their programs. As such, they have had to be sensitive to *all* of the dimensions involved in the process of language-learning by *many* handicapped children. This sensitivity has led to a program which some (e.g., Guess, Sailor & Baer, 1974) have considered to be so complex that it is unapplicable. There is some truth in this. Perhaps the fault lies not in Brickers' program, however, so much as it reflects the problems inherent in a population of young children who require special attention to their overall severe developmental deficiencies. Obviously, this population of children is *not* homogenous, even though it is often considered to be so. Brickers' programs have attempted to span the full scope of the heterogeneity involved in this population. As a result, their programs present the myriad detail which *might* be required at any level within this population.

As a result of their attention to all of the possible needs which might be required for this overall population, the Brickers have actually concentrated on the many *process* variables involved in such attention. In addition, they have perceived these process variables as *separate* and *sequenced in hierarchal fashion*. Indeed, some children may require that each and every process variable be programmed as it is outlined in the Bricker lattice. Other children, of course, might be exempted from some process variable as a result of assessment results. Thus, while we share some of the reactions to

the Brickers' programs as being overwhelming in their processing detail, we still cannot consider these inappropriate. It may well be that the Brickers are much closer to full-range programming reality for such children as we are talking about than are many other programs.

At the same time, however, we would like to suggest that perhaps *some* of the Brickers' processing details might be programmed simultaneously rather than sequentially. In addition, we would concur with MacDonald's (1976) observation that much of their attention to phonological imitation might not be needed. If, for example, the motivation (social) and the semantic (cognitive) bases for communication were well-developed, speech realization might be possible by children without all of the attention on speech imitation given in the Bricker programs very early in their sequence.

In other areas of concern, the Bricker programs do not yet reflect the formal pragmatic function categories which antedate their development. Nor do they show much sensitivity to overall referencing constructs except as that construct is inherent, to some degree, in a cognitive-semantic approach. As to the final question of whether the Brickers' work is so sequenced and task analyzed in terms of the process that it misses the "forest"– that seems unanswerable at this point.

We have said in other contexts (McLean, in press) that language programming for young handicapped and severely developmentally delayed children will never be "elegant." Perhaps the Brickers' programs demonstrate that fact more than some other ones do. If one might offer other perspectives to the overall question, one might consider that the Bricker programs do seem highly "adult" in their perspectives of the language learning process as a whole. Perhaps some movement toward child perspectives of the same process elements might alter their programming perspectives somewhat. As an example and a possibility on this score, we might consider that a more "communication-oriented" view might obviate some of the heavily programmed elements of Brickers' current program efforts. If, for example, more intent and motivation came from the child as a result of his/her social interaction, perhaps some of the elements of their current program could be obviated. This, of course, is unanswerable at this point in our empirical experience.

Overall then, *we* find the Bricker program rather enigmatic––yet provocative and stimulating. Certainly no one interested in the overall problems of language intervention with young children can overlook the immense contributions and perspectives offered in the program offered by the Brickers and their colleagues.

G. Carrier's program Because this program is specifically directed toward mentally retarded children and, thus, may find wide application with young communicatively deficient children for whom some alternative, nonspeech, mode seems desirable, we feel we should discuss this program in the context of the transactional model. It should be obvious from all of our discussions to this point that we cannot be very positive in our view of Carrier's (Carrier, 1974; Carrier & Peak, 1975) program as it now stands.

The reason for our negative reaction to this program is *not* related to its use of alternative-mode approach. Indeed, as we commented earlier in this chapter, there are many children for whom *communication* must be the first and foremost concern and, if an alternative (nonspeech) mode serves this goal, we are most positive about it. Our concern with Carrier's program lies in the *language form* which he targets in the alternative mode. He has gone, essentially, totally structural-grammar in his realization forms and this, we think, is an unfortunate decision.

In moving to a grammar-based repertoire, Carrier ignores all of the psychological "reality" of language with a population for whom this reality is perhaps most important. The targeting of a seven-element syntactic string complete with articles, inflectional endings, and function words as a "tact" (Skinner, 1957) for a static picture-stimulus, does not reflect what we consider to be appropriate in an initial language-learning process. Such an approach ignores all of the interactive variables in language-learning suggested by Bruner (1975, 1974/75). It does counter to Nelson's (1974) call for dynamic variables. It rejects any consideration of developmental factors in both semantics *and* syntax.

Interestingly, the work that this approach is based on, reflected one of the earliest realizations that language "maps onto existing knowledge." Premack's initial work (1970) with his chimpanzee was carefully programmed to teach language encoding of only knowledge which the chimp has demonstrated in nonlanguage ways (e.g., match-to-sample responses). Carrier, instead, makes the age-old assumption that children acquire knowledge about their world through learning language rather than assuming the cognitive-mapping view that is now prevalent.

We have little doubt that there are *some* children for whom Carrier's program might be most helpful. A child with adequate cognitive holdings about the entities and relationships about his/her "world" might do well in learning to map these concepts in Carrier's nonspeech language structures. Severely motorically impaired children, deaf children, and/or children with severe auditory-processing problems might do extremely well in learning complex syntactic forms and using them. In fact, we have *no* doubt that Carrier's *retarded* children learned the "stringing rules" of Carrier's program through the careful sequencing of color-coded-elements training which he provides. What we doubt is that this learning was actually syntax rule-learning for many of these children. In this sense, then, we find great problems in accepting that such stringing-rules had the reality of language-rules, at least for most children involved.

What we would see from the transactional model would suggest that Carrier's nonspeech program could be easily adapted to a developmental communicative perspective and be modified to mark the semantic and pragmatic aspects of language most productively. As it stands now, it is a *syntax* teaching program of considerable elegance but limited scope directed toward a population for whom its value is greatly in doubt.

H. Summary of current program strengths.

We have stated our opinion that *no* program available today manifests *explicit* attention to all of the targeting and procedural concerns which are indicated within a transactional model for language. Since each of these current programs was developed before many of the perspectives covered in this report were widely known and/or available, such deficits in current programs are totally understandable.

Even though current programs do not yet reflect *all* of the perspectives in the transactional model, some of them are relatively close to doing so. The latest available programs (MacDonald, 1976; Miller & Yoder, 1974) strongly reflect the *semantic* bases which we have discussed. Even programs which were developed prior to the availability of semantic and pragmatic data but which were developed with strong empirical bases in *clinical research directly with retarded children* reflect sensitivity to several of the "new" issues. For example, Kent's (1972, 1974) program reflects a strong bias toward action sequences and action attributes even though Bruner's (1975) work was not available to her. Similarly, both Kent and Brickers' (1976) programs reflect high awareness about the need for child "knowledge" to undergird targeted language forms. The Brickers, in fact, were pioneers in the application of Piagetian cognitive constructs to language programming, and Kent's long experience with the retarded child led her to assure that program language targets were entities which were well-known and experienced by the child.

In parallel areas, the most recent representations of behavioral approaches to severely retarded children by Guess, Baer and Sailor (1974) reflect the awareness of language functions as critical to acquisition. Although, as we have stated in earlier sections, the behaviorists had not analyzed language functions to the degree that now appears possible in the light of the work by Bruner (1975) and the taxonomies offered by Dore (1975) and Halliday (1975); nevertheless, their programs reflect this dimension rather strongly. We would, certainly, expect future work by the behaviorist group to move even more strongly in this direction.

Current program strengths. As indicated above, there are several excellent programs in language intervention for young severely communicatively delayed children available today (see Graham's chapter and Fristoe's Inventory in Lloyd's (1976) volume for an up-to-date analysis of all available programs). Since most of these programs have emerged from ongoing clinical programs, most of them

reflect at least intuitive sensitivity to the dimensions of language and the language acquisition process that has been outlined in this project. The fact that many of these sensitivities are not made more explicit in these programs is as much a product of time factors as anything else.

The fact is, however, that many of today's programs have excellent intuitive representations of some of the newer perspectives if one would analyze them carefully. Except for the most recent semantic programs, however, none of the available programs will be organized along any of the specific dimensions presented in this report. Thus, in order to find the representations of these newer perspectives, one will need to approach current programs inductively. That is, one will need to take the perspectives suggested in the transactional model and look for targets and activities in existing programs which are pertinent to these perspectives. As we have indicated, there are many such possibilities in the various programs.

At this point, we shall briefly recapitulate some of the evaluative discussions of the preceding section so that the reader may identify the various strengths which we could identify in current programs--strengths which need to be fully analyzed in the development of strategies which are more inclusive of all of the most recent perspectives regarding the transactional perspectives on language. We have stated that both MacDonald and Miller and Yoder have developed programs which offer excellent representations of the semantic content of child language. We have also judged that Kent's program offers good procedures and targets regarding the action sequence and dynamic attributes even though her work preceded the emergence of these constructs in the literature. We have also noted that the Brickers' work reflects much insight into the overall process of language acquisition and that Guess, Sailor, and Baer's program, along with that of Kent, offers us many perspectives related to the view of the functions of language which prevailed prior to the fuller exposition of this area in current pragmatic perspectives. Finally, we have noted that the Stremel-Waryas program seems to reflect a slightly broader functional approach to attaining syntax structure.

I. Summary of current program weaknesses.

Even though the model from which we are operating stems from a relatively unproven theoretical base, it still seems appropriate to indicate the areas in which current programs appear weak from the perspectives offered by this base. For even if all of our current perspectives would prove not to be totally accurate, there is little possibility that they will all prove to be totally unfounded either. In pointing out these perceived weaknesses, we will make an extreme effort to stay only within the areas which appear to have the very highest levels of face-validity and logical probability.

We see two major weaknesses in today's available programs: 1) a lack of *internal consistency* in terms of current theoretical positions; and 2) a serious lack of *prescriptive properties* which specify the child populations for which they are appropriate. In order to understand these weaknesses and what we consider to be their important implications, we shall need to discuss them each briefly.

1. Internal consistency. As we have seen in our analysis of current programs, most of them are based on *one* of *three* currently dominant theories about the nature of language; transformational grammar; behaviorism; and/or semantic realization. We can see that each of these theories is directed at different aspects of the language system. The grammar approaches concentrate on the structural realizations of a language system. The behavioral theories concentrate on the controlling variables involved in language acquisition and usage. The semantic theories are, generally, directed toward a fuller implementation of the overall psychological aspects of language realization forms from the point of view of their content. As we have noted, a fourth theoretical base is now available in the area of the pragmatic functions of language. This base is not, however, yet fully represented in a currently available language program.

Of the programs which are available and are representative of each of the theoretical bases identified above, each concentrates on the aspects of programming which is best covered by the particular theory base it represents. Thus, grammarians concentrate on generating a full repertoire of base syntactic structures and their transformations. Behaviorists concentrate on bringing a repertoire of verbal responses under antecedent and consequential stimulus control. Semanticist programmers

concentrate on attaining realization forms which encode the various properties and relationships functional in making reference.

Weaknesses in each of these program bases arise when it must deal with a dimension of language which is *not* adequately considered and/or treated from that particular base. Therefore, transformationalist-based programs do not treat the psychological aspects of language content at all and, as a result, these grammatical approaches offer little in the way of directing the appropriate *content* of language forms. Similarly, behaviorists have no base for determining the absolute *forms/structure* of the responses which they bring under stimulus control so they most often move to the products of the grammarians in order to describe language realization forms for their paradigms. Except for MacDonald, et al., even semantic programs still manifest a little schizophrenia when describing the structure of their target responses. Miller and Yoder, for example, describe some of their structure targets in grammatical forms (e.g., subject-verb); some in form-class terms (e.g., noun plus noun); and/or some in semantic terms (e.g., agent-action-object). Stremel and Waryas claim a semantic base and then target grammatical form "rules."

The final result of such cross-theory movement seems best described as problems of *internal consistency*. Since *no one* of these theories adequately treats *all dimensions of the language system,* to manifest such inconsistencies.

Such problems of internal consistency cannot possibly be solved until we adopt perspectives on language which are cognizant of *all* of the dimensions of language. As we have said, there is structure, there is meaning and there is function in language. The key to proper consistency in dealing with each of these dimensions is to deal with each of them in interaction and relationship with the other. Thus, the response topographies in language must be considered in terms of all of its determining properties. A language utterance's *structure* seems affected by its selected semantic content and its user's referential strategy. An utterance's *function* seems determined by internal events controlling the user's needs for social effects. An utterance's *content* seems determined by the interactive relationship between a speaker's communicative strategy and his/her knowledge about various referents which are possible within that strategy. With these perspectives, such mis-matches as identified above should be minimized. So long as language program developers work from single-pole theoretical approaches, however, such inconsistencies will continue to manifest themselves and plague both the language teacher and the language learner.

2. Prescriptive properties. The second major weakness in many current programs for language intervention would seem to us to lie in the area of their inadequate prescriptive properties. If there is one thing that even our gross model-building process should have made clear, it is the fact that language is exceedingly complex in terms of its interdependence on *all* aspects of the human condition and its different behavioral domains.

Current programs would appear to fall far short of offering targets and/or procedures which differentiate their appropriate consumer(s) in terms which are appropriately discrete. The detail we have presented in Chapter 6 on Assessment indicates the sources of much potential variation among members of populations which are considered relatively homogeneous for other purposes. The so-called severely retarded population, for example, can reflect vast differences among its individual children along cognitive, social, and/or linguistic continua. Current programs are inadequate in their provision for differential programming for individual or collective differences among the various populations included in early education programs.

It is this general lack of prescriptiveness which makes the fair evaluation of today's programs problematic. As an example, all of our criticism of the behavioral programs which target syntactic structure are predicated on the assumption that the children to whom such programs are applied will need some careful attention to the semantic and pragmatic elements of the language system. Indeed, however, there are child populations for whom this assumption might not be proper. Many so-called learning disabled children may have perfectly adequate cognitive and social structures for language and merely manifest the problems inherent in auditory processing and motor sequencing skills which make

syntactic form alone a clinical problem. If such cases exist, programs such as Gray and Ryan's (1973), Stremel and Waryas' (1974) and, even, Carrier's (1974) nonspeech alternative mode programs might be highly appropriate in targeting the slot-class correlations, inflectional endings, and syntactic operator usage that these programs target. If, however, we maintain our focus on severely delayed children, we must assume that this population will present the language interventionist with broader systemic deficits which will affect both the cognitive and social-pragmatic domains.

Such specific population issues are, however, indicative of the problems which are most apparent in judging current programs. They also point up an overall problem of perspective which we have had throughout this project. We stated at the outset of this project that we would maintain our focus on young severely communicatively deficient children. In doing so, obviously, we have drastically lowered the scope of our perspectives on language. We have attempted to keep our perspectives firmly fixed on the earliest forms of language as they might be targeted in programs which were dealing with nonverbal children and/or children who were extremely developmentally delayed in their representational skills with language. Thus, throughout this project we have maintained our perceptions that the programs that we were attempting to provide a model for would allow programming to start from zero language repertoires and terminate with language levels roughly equivalent to State II levels (Brown, 1973). If the reader will keep this limited scope firmly in mind, our assessments of current programs can be interpreted within their appropriate context. Obviously, when we are forced to react critically to the work of many gifted and sincere colleagues, we do want our biases and their resultant judgment contexts clear.

It is obvious, then, that our evaluation of the programs cited above are biased by our perception of their appropriateness to young severely deficient clinical subjects. It does seem clear that none of the programs mentioned above really intend that they be limited to children with only syntactic problems. In fact, Carrier's program was specifically developed for severely mentally retarded children and Stremel and Waryas' program is also directed to moderately to severely retarded populations.

There are some provisions in this dimension, however, and these should be recognized. MacDonald's program includes assessment instruments calibrated to his treatment programs. Other programs are highly developmental in their structure and specify entry behaviors (e.g., Miller & Yoder; Stremel & Waryas). Still other programs, like the Brickers', are multi-dimensioned and include some assessment procedures. Thus, their program offers some appropriate accomodation of individual differences in several domains. Most other programs, however, some by philosophical constraints and others by omissions, do not offer adequate or specific accommodation to individual or population differences. Even those programs which do offer some basis for selective use do not do so in a fashion sufficient to meet the demands of the overall problem.

In a sense, this lack of *prescriptive* properties among current programs is a reflection of the knowledge constraints under which they have been developed. As we have said several times, now, most of these programs have been developed in deprivation of pervasive and productive perspectives about language and language acquisition dynamics. It is a wonder we have programs as good as we have considering the knowledge bases they have had to work from over the past decade. That the current programs do not reflect adequate or appropriate prescriptive dimensions in their targeting selection and/or their sequencing patterns, is, certainly, not surprising. Nor does this citing of this failure represent any attempt to denigrate the fine efforts they represent. This is, however, an area of relative weakness that we must be aware of and work to strengthen. For unless we attend to some very careful work in developing differential programming for various types of specific deficits among children, we cannot hope to become truly effective in our language intervention services to the highly diverse group of children which all exist under the label of young, severely communicatively handicapped.

When we suggest becoming more prescriptive, we mean that programs must be designed to offer appropriate targets and procedures for a complex of subject deficits and, most likely, combinations of deficits. For example, a program should be *designed* to meet a subject's (or group of subjects') *cognitive* level in interaction with his/her *social* level in interaction with his/her *linguistic* level. Current programs offer too little in the way of integrated specifics for offering such prescriptive offerings. Hopefully, more theoretically integrated future programs will offer more potential along these very necessary lines.

I. **Early Modes Demonstrating Awareness (0-4 months)**
   A. Stops motor actions and shows distress to change in human expression.
   B. Fixates on faces of other individuals.
   C. Early cyclic rythmic qualities to early parent-infant interaction with infants alternating from attention to non-attention.
      e.g., Kaye and Brazelton (1971) report that the child exhibited differential participation in early interactions involving mutual gaze, gross movements, and facial expression changes.
      Jaffee et al (1973) observed that early gaze behavior between adult and child exhibited a reciprocal quality mirroring turntaking that takes place in adult conversation.
   D. Infants contingently avert their gaze when adult stimulation becomes "too intense."
   E. When adults are unresponsive infants intensify their efforts to elicit attention before resorting to crying.
   F. Infant stops crying when picked up.
   G. Laughs aloud.
   H. Follows adult line of regard. (Bruner (1975) e.g., Adult and child display mutual gaze - adult looks away to another locus for no obvious reason - child will change his/her locus of attention to match the adult's locus of attention.

II. **Cognitive Bases for Curriculum-Sensorimotor (0-2 years)**
   A. Means/ends
      1. Hand-watching behavior
      2. Visually directed grasping
      3. Repetition of actions producing interesting results
      4. Letting go of one object to reach for another
      5. Locomotion as means
      6. Relationship of support
      7. Use of support (object)
      8. Use of support (person)
   B. Object permanency
      1. Horizontal tracking
         a. midline-out
         b. out-midline
         c. out-out (180°)
      2. Noting disappearance of slow moving object
      3. Finding partially covered object
      4. Finding completely covered object
      5. Finding an object which is completely covered with single screen in two places
      6. Finding an object completely covered with a single screen in two places alternately
      7. Finding an object which is completely covered with single screen in three places
   C. Causality
      1. Appearance of handwatching
      2. Repetition of actions producing an interesting spectacle
      3. Use of specific action as "procedure"
      4. Behavior in familiar game situation
      5. Behavior to a spectacle created by an agent
      6. Behavior to a spectacle created by an agent acting on an object
      7. Behavior to a spectacle created by a mechanical object

D. Space
   1. Observing two objects alternately
   2. Locating an object by its sound
   3. Grasping visually presented object
   4. Following trajectory of moving object
   5. Relationship of container and the contained
   6. Appreciating gravity in play with objects
   7. Making detour
   8. Noting absence of familiar person

E. Imitation
   1. Vocal
      a. contagion
      b. mutual
      c. spontaneous
         1) old
         2) new
   2. Motor
      a. imitation of familiar schemes
      b. imitation of complex actions composed of familiar schemes
      c. imitation of unfamiliar visible gestures
      d. unfamiliar invisible gestures

F. Play
   1. Holds
   2. Mouths
   3. Hits
   4. Shakes/waves
   5. Slides
   6. Swings
   7. Tears/stretches
   8. Lets go
      a. drops
      b. throws
   9. Socially instigated actions
      a. drinks
      b. wears
      c. drives
      d. builds
      e. hugs
      f. dresses
      g. shows
      h. gives
   10. New actions/old objects and old actions/new objects

G. Early classification
   1. Types of classifications
      a. action/object
      b. socially appropriate action/object
      c. perceptual classifications
      d. functional classifications
   2. Developmental progression

III. **Early Modes Demonstrating Social Awareness (4-12 months)**

A. Child exhibits vocal contagion (see communication module for explanation).

B. Child exhibits mutual imitation - this is a sequence of verbal interactive behavior in which the child initiates an utterance, the adult imitates the child. This is followed by the child's contingent imitation of the adult.
Child ⟶ Adult imitation ⟶ Child imitation.

C. Exhibits spontaneous motor and vocal imitation.

D. Responds differentially to friendly vs. hostile voices.

E. Responds appropriately to harsh no.

F. Engages in imitative games
1. task reciprocal but nonidentical roles in caretaker/child routines.

G. Shows objects to others.

H. Shows and then gives objects to others.

I. Gives objects to others.

Shortly after one year of age the child begins to:

J. Point spontaneously to objects located in the environment that are of interest to him/her.
This skill is critical in the child's development of communicative skills as well as being important in early socialization.
It is important for the presenter to note that at very early points in the child's social development, s/he engages in initiated as well as responding behaviors. Additionally, s/he acts to continue social interactions as in the case of early imitation and early object permanence routines (e.g., peek-a-boo).

IV. **Early Schemes in Relation to Objects - the early emission of playlike behavior between zero (0) and twenty-four (24) months.**

A. Staring - the child directs his/her undivided attention to an object and continues to maintain that attending behavior for an extended period of time without taking steps to explore (visually or motorically) the object.

B. Mouthing - the child explores and examines an object by taking it to his/her mouth. This behavior is particularly apt to occur with objects that might resemble a nipple (perceptual overgeneralization).

C. Shakes and waves - objects are indiscriminately shaken and waved regardless of whether the appropriate use of the object entails such actions.

D. Bangs objects on surface - this behavior may be observed in conjunction with the preceding. As with the previous behavior the child does not attempt to discriminate between bangable toys and nonbangable toys.

E. Bangs two objects together (see above comments)
Note: when evaluating behavior believed to be socially or cognitively inappropriate, it is important to consider the fact that normal children exhibit the above behaviors with substantial frequency up to eight months of age. Even beyond eight months a substantial frequency of the above behaviors remains in the child's repertoire.

F. Manipulates physical properties of objects
The following self-exploratory behaviors represent a more sophisticated interaction with objects. In the beginning the child may not necessarily discriminate which objects may be pushed and pulled and which objects can be stacked. At slightly later points in time, however, s/he does begin to match appropriate actions with appropriate objects.
1. pushes/pulls
2. takes out/puts in
3. stacks and pushes over

G. Manipulates movable parts of toys - child begins attending to specific physical attributes of toys to the extent that s/he begins to develop action schemes in conjunction with the moveable parts.

H. Separates parts from toys (see preceding description).

I. Examines objects - this activity differs from previously described staring in that the child may manipulate the object while shifting his/her focus from one salient feature of an object to another.

J. Demonstrates functional use of objects (e.g., combs hair with comb).
K. Demonstrates representational use of objects (e.g., uses block to represent spoon which is used to feed oneself).

V. Socialized Verbal Behavior between eighteen (18) and twenty-four (24) months

A. Responds to questions/commands. (see communication portion of module for a more indepth explanation.)
   1. What
   2. Yes/No
   3. Where
B. Initiates questions/commands.
C. Begins turntaking in dialogue.
D. Begins early requests for communicative feedback.

VI. Interpersonal Aspects of Play between twenty-four (24) and thirty-six (36) months

A. Shifts from prior consistant selection of toys over people during play time.
B. Shifts attention less rapidly than experienced before.
C. Acknowledges the presence of other children in play environment.
D. Participates in parallel play.
E. Child engages in make believe games with dominant interest in animated toys (24 months).
F. Child introduces absent objects into play (e.g., child pretends to feed doll even though s/he has no spoon). (26 months).
G. The child uses one object to symbolically represent another. (Tears up pieces of paper to represent food). (26 months).

VII. Assessment of Play Behavior

A. Nature of child's interaction with others
   1. Solitary play - a self gratifying behavior that may or may not be exhibited in the presence of other individuals. The child engages in this behavior without regard for and without attending to the actions or reactions of others in the environment.
   2. Onlooker to play - the child does not take part in "play" behavior but instead attends to others engaging in self gratifying activities.
   3. Parallel play - child engages in self gratifying behavior that is of the same topographs emitted by another in the same environment. In the exhibition of this behavior, however, the two individuals never directly interact.
   4. Cooperative play - two or more individuals participate in a mutually gratifying activity. In performing the activity, the two individuals are fully aware of the other participant's presence and actively perform reciprocally individual tasks making up the activity.
B. The effect of stimulus conditions upon play behavior.
   1. Effect of play materials (reinforcer preference)
   2. Effect of verbal or motor cuing by parent or teacher
   3. Effect of peers' activities
C. Types of play materials useful in assessment.
   1. Reactive - toys that do not move when acted upon
   2. Positionable - toys that change location or state when acted upon
   3. Transitional - toys or objects that can change form (bean bags, ice cubes).
D. The quantification and qualification of play.
   1. Duration of play
      a. Independent
      b. Parallel
      c. Cooperative
   2. Diversity of play
   3. Spontaneity of play
      a. Initiations
      b. Responses
      c. Turntakes

d. Reversible turntakes (e.g., if one person hands an object to the second, can the second perform the same action with a different object. Thus, is turntaking the goal of the interaction or the act of exchanging a specific object.)

E. Assessment of type of object manipulation (see IV.)

VIII. Stimulation and intervention in the establishment of play behavior.

A. The content
   1. Developmental approach-considerations
      a. Cognitive entry skills of the child
      b. Motor entry skills of the child
      c. Existing play behavior
   2. Behavioral approach - considerations
      a. Motor entry skills of the child
      b. Existing play behavior

B. Environmental considerations
   1. Toy proximity
   2. Selection of play materials
      a. Reactive materials
      b. Socially oriented materials (table games)
      c. Examples of toys frequently selected for play

C. Teaching techniques used in the establishment of play
   1. Antecedent events
      a. Motor demonstration
      b. Motor cue
      c. Verbal instruction
      d. Verbal cue
      e. Combination of the above
   2. Consequent events
      a. Physical prompting
      b. Verbal prompting
      c. Fading physical and/or verbal prompting
      d. Tangible reinforcing
      e. Social reinforcing
      f. Intrinsic reinforcement

D. Programming areas for play behavior in severely-profoundly retarded nonambulatory children functioning between birth and two years of age.

Instructor Note:

Be sure to stress relationship between early play behavior and early communicative behavior.

1. Visual follow and find
2. Auditory follow and find
3. Tactile follow and find
4. Reaction to spontaneous movement of a toy
5. Mutual attending
6. Reaction to facial gesture
7. Following the line of regard of another
8. Anticipatory search
9. Instinctive grasp (catch and hold a distally moving object making contact between forefinger and thumb)
10. Spontaneous grasp (visually directed without the need for tactile cue)
11. Batting
12. Repetitive batting
13. Spontaneous reaching
14. Contingent reaching
15. Detoured reaching
16. Spontaneous object manipulation (see I, A-L for specific manipulations)

17. Taking
18. Showing
19. Giving
20. Taking object and manipulating for extended time (independent play)
21. Early turntaking
    a. Vocal
    b. Motor
    c. Motor involving the change in location of an object

E. Programming areas for the establishment of parallel and/or cooperative play in severely/profoundly retarded children.
1. Gross and fine motor activities
    a. Ball rolling
    b. Throwing a ball
    c. Swinging a bat
    d. Climbing ladder bars
    e. Swinging
    f. Hula-hooping
    g. Jumping
    h. Riding
        (1) Scooter board
        (2) Tricycle
2. Table games requiring fine motor eye-hand coordination, sensorimotor, and early preoperational skills
    a. Tic-Tac-Toe
    b. Checkers
    c. Language game (monopoly-like game based on word recognition skills)

IX. The maintenance and generalization of play behavior.

A. Environmental effects
1. Setting
2. Different trainer
3. New materials

B. Behaviors incompatable with spontaneous emission in the environment.
1. Bizarre mannerisms
2. Temper tantrum
3. Noncompliance
4. Aggressive behavior

VOCATIONAL TRAINING LECTURE NOTES

I. **Background of Vocational Training for Severely/Profoundly Handicapped**
   A. Before 1970, retarded persons labeled as severely/profoundly handicapped were not included in work training, nor thought capable of vocational rehabilitation.
   B. Gold's line of research (1972-74) demonstrated that the moderately/severely handicapped could acquire complex manual assembly skills.
   C. Bellamy's research as well as work done at Wisconsin and Texas Tech indicated in 1976 that the severely/profoundly handicapped were very capable of acquiring work skills and producing at an acceptable rate.

II. **Types of Work Environments**
   A. One to one intensive training
   B. Work adjustment program
   C. Sheltered workshop training with subcontracts
   D. Community placement

   Least restrictive placement refers to performing work skills in an environment in which the trainee can function capably with the least amount of supervision.

III. **Selecting Relevant Vocational Skills**
   A. These should be work skills which the community can support.
   B. Skills should be selected on the basis of whether they are appropriate for the next environment to which the trainee will move.
   C. Tasks may be found at other workshops in the community, local service agencies (Red Cross) or local factories.

IV. **Beginning a Vocational Program**
   A. Steps
      1. Assess the physical location of work training
      2. Establish length of the work day
      3. Select tasks from the community (some "sit down" tasks; some domestic tasks)
      4. Create a work environment, incentive system
      5. Do an informal "eyeball" assessment and place trainees into teams which are homogeneously grouped
      6. Secure raw materials for tasks
      7. Do a formal task analytic assessment
      8. Begin training and establish a reinforcement program
      9. Modify the program and evaluate its progress
   B. Components of an effective vocational training program
      1. Utilization of a task analysis approach to presenting skills
      2. Consistency and structure in the vocational setting
      3. Carefully collected data on the student's work performance
      4. A method to facilitate transfer and maintenance of the training

V. **Problems of Vocational Training for Severely/Profoundly Handicapped**
   A. Behaviors that interfere with work activities
   B. Low productivity levels
   C. Sensory-Motor deficits of students
   D. Failure to attend to the relevant cues of a task
   E. Relating prevocational curriculum to the vocational placement situation

VI. **Vocational Instructional Procedures - Acquisition**

A. Teacher task analyzes the skill.
B. Teacher models the first step of the sequence and instructs the student to match the modeled behaviors.
C. If the student matches the behaviors s/he is reinforced immediately.
D. If the student does not match the modeled behaviors then s/he is physically prompted through the step.
E. The teacher fades the prompt and returns to the sequence.
F. When the first step is occurring consistently, then the procedure is repeated on the second step withholding the reinforcement until the successful completion of steps 1 and 2.
G. This procedure is repeated until all steps of the sequence are learned.

VII. **Vocational Procedures - Production**

A. Tangible reinforcer plus praise for each unit or part of each unit
B. Positive practice training
C. Response cost - loss of reinforcer for not meeting work criteria
D. Self reinforcement

General Rule in Normal Development

Normal development goes along in a predictable manner. Seven rules to remember are:

1. **There is an ordered sequence of events.**
2. **Children learn at their own individual rates.**
3. **There is a cephalo-caudal (head-tail) direction of control.**
4. **There is also a proximal-distal (body midline-outward) direction of control.**
5. **Children progress from mass-movement to isolated movement patterns.**
6. **There is an overlapping of stages in development.**
7. **There is reciprocal interweaving of movement.**

Growth is an increase in physical size.

Development is the increasing control of skilled movement.

Characteristics of Early Reflexes

Primitive reflexes control the distribution of postural tone throughout the body.

1. Moro
2. Tonic labyrinthine——prone
3. Tonic labyrinthine——supine
4. Symmetrical tonic neck reflex (STNR)
5. Asymmetrical tonic neck reflex (ATNR)
6. Neck righting
7. Parachute
8. Positive supporting
9. Planter grasp
10. Labyrinthine and optical righting
11. Landau

GROSS MOTOR DEVELOPMENT

Transparency 4

Age Range	Skill	Postural Mechanism	Reference
0 to 4 Months		Asymmetrical Tonic Neck Reflex	Bobath
		Traction Reflex	
		Foot Grasp	
		Moro	
	Rolling	Nonsegmental rolling from back to side often assiciated with the Moro	McGraw
		Turns face and extends neck so that shoulder lifts; head flexes to complete the roll	McGraw
	Crawling	Newborn remains in total flexion	
		Spinal Extension - head lifts up	
		Spinal extension - back extends	
		Attempted movement leads to pivot	McGraw
	Sitting	Head lags when pulled to sitting	
		Head maintains alignment with body; legs remain inactive when pulled to sitting	
	Standing	Flexed Position - child does not aid	McGraw Pieper
	Locomotion	Automatic (reflex) stepping	
		When held under arms stepping is inhibited; head erect	McGraw
4 to 8 Months		-ATNR	
		-Foot Grasp	
		-Moro	
		+Labyrinthine Righting	
		+Optical Righting	
		+Landau	
		+Propping	Bobath
		+Equilibrium Reactions in Prone and Supine	

GROSS MOTOR DEVELOPMENT

Transparency 5

Age Range	Skill	Postural Mechanism	Reference
4 to 8 Months (cont.)	Rolling	Segmental rolling with no trunk extension until child is in prone, leg pulls over first followed by shoulder	
		Segmental rolling followed by less flexing to assume either crawl or sit position	McGraw
	Crawling	Assumes position with abdomen off the floor - rocks back and forth	McGraw
		Progression: Right arm and left leg move together followed by left arm and right leg.	McGraw
	Sitting	Ventral Push: Prone All fours Raise trunk and abduct one leg and Sit Dorsal Push: Lateral position Pushes against floor with one arm Raises legs off floor slightly Pushes to sitting	McGraw
	Standing	When held under arms, child places feet on surface and pushes into extension; aligns pelvis and shoulders	
	Locomotion	When held under arms, child flexes knees but keeps feet on ground.	
		When held by hand child steps, flexing knees and lifting feet off the floor	McGraw

GROSS MOTOR DEVELOPMENT

Transparency 6

Age Range	Skill	Postural Mechanism	Reference
8 to 12 Months		Primitive reflexes absent +Propping +Body righting +Equilibrium reactions in prone, supine, sitting	
	Rolling	Sequence complete	Bobath McGraw
	Crawling	Now the most efficient means of mobility	White
	Sitting	Dorsal push to sitting most frequent	McGraw
		Protective responses now apparent to the front, side, and back	Milani-Comparetti
		Falls to sitting from standing	Gesell
	Standing	Pulls to standing on furniture Stands alone momentarily	Bayley
	Locomotion	Takes steps with both hands held	Bayley
		Begins to climb on furniture	McGraw
12 to 18 Months		+ Equilibrium in prone, supine, sitting, kneeling and standing	Bobath
	Rolling	Sequence complete	
	Crawling	Sequence complete	
	Sitting	Protective and equilibrium responses well established	Bobath
	Standing	Assumes standing independently from quadraped position	McGraw
	Locomotion	Independent steps: High guard, high steps, toe grip, plantigrade	
		Heel-toe progession, normal base heel of forward foot touches when toe of back foot touches	McGraw
		Lowers to sitting Vestibular stimulation	White

GROSS MOTOR DEVELOPMENT

Transparency 7

Age Range	Skill	Postural Mechanism	Reference
18 to 24 Months		Equilibrium and protective reactions established	Bobath
	Rolling		
	Crawling	Sequence complete; used in play	McGraw
	Standing	Stand from sitting to squat to upright	McGraw
	Locomotion	Variations on walking running	
		Walks sideways, backwards	
		Walks stairs unaided, 2 feet per tread	
		Stands on one foot	
		Jumps from step	
		Walks on tip toes	Bayley

FINE MOTOR DEVELOPMENT

Transparency 8

Age Range	Skill	Reference
0 to 4 Months	Visual regard for objects 24" away Eyes converge on hand and fixate 5-10 seconds Traction reflex	White, Castle, Held
Pre-Grasp Period	Regards objects 6" away Regards hands frequently Hands fisted Immediate interest in objects Accurate swipe with one hand (forward and downward movement); no grasp	White, Castle, Held Bruner
	Raises hand to object and shifts visual regard back and forth to object Hands predominantly open - avoidance reactions	White, Castle, Held Bayley Towuen
	Bilateral hand activity Hands clasped at midline (arms extended) Immediate visual regard of object	White, Castle, Held
	Hands raised in midline Midline activity — fingering clothes, playing with fingers	White, Castle, Held
	First crude grasp - fumbles at object (palmar) May open hand in anticipation of contact	White Castle, Held
	Reach accurate successful palmar grasp in supported sitting, supine. Brings object to mouth.	Bayley White, Castle, Held Touwen

FINE MOTOR DEVELOPMENT

Transparency 9

Age Range	Skill	Reference
4 to 8 Months	Palmer Grasp	Gesell
	approach by pronation	Bayley
	ulnar palmar grasp	Touwen
	Radial Grasp - Picks up one toy at a time; repeating approach supination	Fenson
	Scissors Grasp - Motor activities such as banging, mouthing, fingering, shaking	
Discovery of the effects of his own action (Flavell)	fractionation of grasp reflex	
	Unilateral reach	
	Pronation-supination of forearm	
	Drops object rather than placing it down	Connolly
	Transfers objects from hand to hand	
	Hands are used in cooperation i.e., retains two cubes	
	No more over reaching	Bayley
8 to 12 Months	Inferior Pincer Grasp	
Motor skills used in purposeful goal directed play (Flavell)	Pointing	
	Pincer Grasp	
	Simple Relational Play: Begins to combine two objects such as spoon and cup, blocks and cup, attempts to stack blocks, to scoop, place and replace	Fenson
	Releases toys on purpose	
	Begins means end play i.e., pulls string to obtain toy	Bayley
12 to 18 Months	Accomodative Relational Acts: child combines objects appropriately based on physical or functional similarities.	Fenson
Motor skills used in trial and error exploration	Pincer grasp and release is now smooth and accurate to allow for exploration of small objects.	White
	Motor skills are now a mens to play and functoinal skills as reflected in typical assessment items such as: Places 1" peg in hole	
	Turns page of book	
	Removes lid of a box	
	Builds block tower	
	Places forms in form board	Bayley

FINE MOTOR DEVELOPMENT

Transparency 10

Age Range	Skill	Reference
	Holds crayon, scribbles	Bayley
	Finger feeds	Rise
	Drinks from a cup	Rise
	Attempts use of spoon	Rise
18 to 24 Months	Basic fine motor skills of grasp and release have been achieved. Now refinement of those skills to develop the use of tools; dexterity, control and precision. Examples of typical functional or play skills found on assessments:	
Symbolic Play (Flavell)	Holds crayons, scribbles, imitates horizontal line.	
	Attains toy with stick	Bayley
	Replaces body parts on doll	
	Places pegs in hole	
	Lines up blocks for train or tower	Rise
	Begins to develop hand preference	
24 to 36 Months	Pours from a container	
	Copies + and H	
	Places forms on formboard	Bayley
36 to 48 Months	Cuts with scissors	
	Copies circle	
	Strings beads	
	Copies T	
	Isolated finger movements.	Bayley Gesell

Figure 1 **Toilet Training Recording Form** Transparency 11

Name _____ Month _____

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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Coding Symbols:
- = Urination Off Potty
- = Urination On Potty
- = Bowel Movement Off Potty
- = Bowel Movement
- = On Potty; Nothing
- = Liquids Given To Child

Daily Comments:

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RAPID TOILET TRAINING

Rapid toilet training should result in a child being trained in an average of five days, depending on teacher skill and child's functioning level.

Rapid toilet training involves the following components:

1. Placement of child on toilet regularly at half hour intervals.
2. Giving of fluid during these intervals.
3. Immediate reinforcement for elimination into toilet.
4. Reinforcement for dry pants every two to five minutes.
5. Full cleanliness training when child has accidents.
6. Fading of reinforcement and teacher assistance which leads to self-initiated toileting.
7. Planned maintenance program characterized by periodic dry pants inspections.

I. Sequence of Steps in Bladder Training

1. Give as much fluid to child as s/he will drink while seated in a chair approximately 3 feet from toilet.
   a. Wait about 1 minute

2. Direct child to sit on toilet using minimal amount of assistance.

3. Direct child to pull down pants.

4. a. When child voids give edible and praise immediately. Have child flush toilet.
   b. If child does not void in 15 minutes, direct him/her to stand and pull up pants.

5. Direct child to chair.

6. After child has been sitting for 5 minutes inspect him/her for dry pants. Praise immediately if dry.

7. At end of 30 minutes, begin sequence of steps again.

*Correction Procedure: Have child clean up accident immediately.

II. Self-Initiated Toileting and Maintenance of Results

1. Self-initiated toileting means a child has gone to the toilet him or herself with no verbal or physical prompt.

2. Continue to give fluids immediately following an elimination.

3. Begin to move child's chair gradually further away from the toilet with each self-initiated toileting response.

4. Gradually lengthen amount of time between dry pants inspections.

5. Intermittently reward correct toileting.

6. Require child to show you that s/he can find the toilet from various parts of the classroom.

7. Once child is self-initiating regularly, the chair may be removed. A maintenance program should be implemented which provides for regular dry pants inspection periods in which the child will be either praised or required to go through the cleaniness training procedure.

DEVELOPMENT OF EARLY SITUATIONAL COMPREHENSION

	Cue: Motor	Adult verbal
1. peek-a-boo	cover eyes	"peek" "peek-a-boo"
2. patticake	clap hands	"patticake"
3. I'm gonna	chasing child taking step to child	"I'm gonna get you"
4. so big	extending arms out	"so big"
5. horsey	adult on all fours	"horsey"

SITUATIONAL PRODUCTION

	Cue: Motor	Child verbal
1. attention	presence of adult	vocalize
2. pick up things I drop	child drops object	———
3. come and get me	approach adult → take a step away	vocalize
4. show	approach adult extend hand	———
5. show and give	approach adult extend hand place in adult hand	———
6. give	(smoother)	optional
7. point	locate object → point to object then point to adult then point to object	optional

SUMMARY OF NONLINGUISTIC RESPONSE AND COMPREHENSION STRATEGIES

Age	Strategy
8-12 months	1. Look at objects mother looks at. 2. Act on objects noticed. 3. Imitate ongoing action.
	These are context determined responses
12-18 months	1. Attend to objects mentioned. 2. Give evidence of notice. 3. Do what you usually do in the situation.
18-24 months	1. Locate objects mentioned. 2. Give evidence of notice. 3. Do what you usually do. 4. Act on objects in way mentioned. *child as agent *choose handier object as instrument
	Word comprehension but context determined meaning
2-4 years	1. Do what is usually done. *probable location *probable event 2. Supply missing information.

LEVELS OF AUGMENTATIVE MODES OF COMMUNICATIVE EXPRESSION

I. Communication boards
   A. Scanning
   B. Direct selection
   C. Encoding

II. Manual communication
   A. Pointing
   B. Conventional gestures
   C. Home signs
   D. Formal sign system
   E. Finger spelling

LEVELS OF REPRESENTATION FOR COMMUNICATION BOARDS

1. **Concrete symbols** — Example:
   minature objects
   real objects

2. **Pictographic symbols** — color photographs
   black and white photographs
   line drawings

3. **Relational symbols** — rebus
   = on
   = in

4. **Abstract symbols** — rebus
   = all
   = is

CONSIDERATIONS IN SELECTING AUGMENTATIVE COMMUNICATIVE DEVICES

1. Cognitive abilities

    * means/ends
    * object permanency
    * causality
    * spatial

2. Existent language comprehension

3. Existent language production capacity

4. Motor abilities

5. Visual abilities

6. Communicative environment

CONSIDERATIONS IN SELECTING SIGNS TO TEACH IN EARLY COMPREHENSION/PRODUCTION

1. Cognitive requisites for comprehension
2. Iconic features of sign
3. Motor movement sophistication required to produce sign
4. Visibility of sign
5. Opportunities provided by the natural environment to produce and/or comprehend sign
6. Reinforcement value of sign

MEANS/END

1. Hand/eye coordination
   handwatching behavior

2. Hand/mouth coordination
   mouthing fingers

3. Visually directed reach/grasping
   *reaches when both toy and hand are in view
   *reaches when only toy is in view
   *grasps when both hand and toy are in view
   *grasps when only toy is in view

4. Drops one object to retrieve another

5. Reaches for object while holding another

6. Drops one of the two objects to free hand

7. Means/end support

8. Does not pull to support when toy held above

9. Locomotion
   *reacts to toy loss
   *moves to retrieve

10. Tool use object

11. Using a person

OBJECT PERMANENCY

1. Following an object
   partial
   ↓
   complete
   arc
   - *jerky accomodations
   - *smooth accomodations

2. Disappearance of slowly moving object
   *follows but loses object and interest
   *lingers with glance at point of disappearance
   *lingers - returning eyes to starting point
   *above - searches around point of disappearance

3. Retrieves partially covered object

4. Hiding under one or more places
   *visible displacements
   *invisible displacements

DEVELOPMENT OF CAUSALITY

* Appearance of handwatching
* Repetition of actions producing an interesting spectacle
* Use of specific action as a procedure
* Behavior in a familiar game situation
* Behavior to a spectacle created by an agent
* Behavior to a spectacle created by an agent acting on an object
* Behavior to a spectacle created by a mechanical object

DEVELOPMENT OF SPATIAL RELATIONS

* Observing two objects alternately
* Locating an object by its sound
* Grasping a visually presented object
* Following the trajectory of a moving object
* Relationship of the container and the contained
* Appreciating gravity in play with objects
* Making detours
* Noting the absence of a familiar person

IMITATION

Vocal
- * contagion
- * mutual
- * spontaneous
  - * old
  - * new

Motor
- * imitation of familiar schemes
- * imitation of complex actions composed of familiar schemes
- * imitation of unfamiliar visible gestures
- * imitation of unfamiliar invisible gestures

DEVELOPMENT OF REPRESENTATIONAL PLAY

Age	Behavior
16-20 months	Uses objects in functionally appropriate fashion
16-24 months	Uses object primarily for its specific purpose
	Plays make believe games with a prevailing interest in animate toys
20-32 months	Introduces absent objects into play
	Uses props to enact roles

OBSERVATIONS OF PLAY

1. Duration (how many minutes/seconds does the child physically act on the toy?)

2. Variety:
   * number of toys
   * which toys
   * persons
   * actions
     * intra-object
     * inter-object

3. Proximity of:
   * toys
   * persons

4. Social interaction:
   * Does the child self-initiate verbal or nonverbal interactions?
   * If so, how long do they occur?
   * How does the child respond to interactions directed toward him/her?
   * Who are the preferred recipients of any initiated interaction?

5. Cueing systems used

Toilet Training the Handicapped Child

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Victor L. Baldwin
David N. Grove
William G. Moore
with contributions by Victoria Furey, Mary Ann Gage,
Elizabeth Jordan, Lynn Levak, Cheryl Riggs and Meredith Wadlow

If children possessed the skills of behavioral scientists, they would report to us that mothers in the United States progress through a series of stages during each of which specific developmental tasks preoccupy their time, thoughts and energies. With considerable certainty they would predict that toilet training would be the preoccupation at sometime for mothers of children whose ages range between 1 1/2 and 4 years. Further observations would suggest that many young mothers follow the toilet training procedures prescribed by their pediatricians. Despite the fact that children are not trained behavioral observers and reporters, it is true that toilet training does become an important topic for their mothers and that for many their major source of information is the pediatrician.

Unfortunately, most mothers of handicapped children, especially mothers of retarded children, have not found the methods which work for normal children helpful. For those mothers the process of toilet training seems agonizingly slow and becomes one of the most frustrating experiences they face. The frustration is exaggerated for parents who previously have raised normal children. They typically find that techniques which were once successful do not work with the same degree of success with their retarded child.

The difficulty of toilet training the retarded child is best illustrated by the time and effort put into the toilet training of retarded children who are institutionalized. In many institutions it is one of the major priorities in training, and unfortunately for many years was the only training provided.

As is the case for most learned tasks, retarded children acquire toilet training more slowly than normal children (Baumeister, 1967), and this is the basis for parent frustration. Consequently, this paper is designed to present to parents and teachers of retarded children a method of toilet training which will provide feelings of success instead of frustration.

Review of the Literature

Probably one of the best early studies on toilet training was conducted by Kimbreel and Luckey (1966) in an institutional setting. In this study they conducted a habit training program for severely and profoundly retarded children. They utilized a technique of training that took the child to the bathroom at specified times in order that the child would learn the habits of toilet training. Another attempt to teach toilet training activities to profoundly retarded patients whose chronological ages varied between eight and fifteen was conducted in 1965 also in an institution (Bensberg, Colwell and Cassel, 1965). Training lasted seven months, utilizing food reinforcers for the first four months. At the conclusion, subjects were generally toilet trained. Baumeister and Klosowski (1965) utilized operant conditioning techniques in an attempt to group toilet train severely retarded children in an institution. At the same time, Hundziak, Mauer and Watson (1965) demonstrated that behavior modification techniques were better than conventional methods in the toilet training of the severely retarded. In addition, they reported that these skills would generalize to living groups from clinical situations.

Many investigators have been concerned with nocturnal bedwetting and various conditioning techniques have been developed to cure this difficult behavior. These are best exemplified by Sloop and Kennedy (1973) where they utilized electrical warning devices with institutionalized retarded. The devices were activated by urine and consequently alerted the trainer and child through a warning

The authors wish to express their professional admiration of Mrs. Phyllis Mix, the first teacher to try this method. She developed the rudiments of the recording form utilized herein. They also wish to thank Dr. James Beaird for his editorial input.
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buzzer. They were successful with eleven of twenty-one people whom they were trying to condition, whereas a control group of a similar size only had one individual show a spontaneous recovery. Unfortunately, follow-up data showed four of the eleven successes relapsed after six months, indicating that maintenance procedures are essential. Azrin, Sneed and Foxx (1974) demonstrated much greater success with 24 eneuretic children (normal intelligence) who with their methods of one all night training session averaged only two bed wettings before achieving 14 consecutive dry nights and had no major relapses.

Perhaps the most recent publication describing a complete program of toilet training has been published by Foxx and Axrin (1973). Their methods require an intensive, total commitment to toilet training.

Rationale for this Program

As was mentioned above, toilet training is a tedious process with the retarded child. Therefore, the goal of this program is to make the process less tedious and to make the most efficient use of the parents' time and effort.

The learning theory on which the program is based, behavior modification, has demonstrated repeatedly that when children are reinforced for a behavior, that behavior is apt to occur again. Reinforcement in this sense means telling the child that s/he did well; it means rewarding the child or giving him/her a sign or signal that indicates that s/he has done a good job. The problem with utilizing reinforcement techniques with toilet training is that the desired behavior (i.e., urination or defecation in the toilet) does not occur, and consequently the parent never has the opportunity to reinforce the child. One solution is to put him/her on the toilet frequently and for long periods of time until s/he does urinate or have a bowel movement, at which time s/he would be reinforced. This process is tedious and time consuming for the parent and is, therefore, rejected as a viable alternative. Instead, our approach operates on the principles of first determining the most probable times when urination and defecation on the toilet might occur and then placing the child on the toilet at those most probable times. In this way the program does not require an all day intensive effort, but only chooses one or two times during the day in which to initially begin the toilet training program. As the child achieves success, this time is extended into other parts of the day. Thus, the object is to reduce frustration by demonstrating success with minimum time expended.

Toilet Training during Waking Hours

The parent is the one who determines when it is time to begin toilet training their retarded child. This time may be comparable to the ages at which normal children are trained, between the ages of 1 1/2 and 4.

This program contains seven basic steps or activities which parents must accomplish in toilet training their child: (1) establishing a baseline record of the child's urination and defecation behavior; (2) using that record to decide the most appropriate times of the day at which to conduct training; (3) selection of reinforcers to use during training; (4) conducting the training; (5) maintaining records during training; (6) expanding training to other periods of the day; and (7) helping the child learn to indicate toileting needs. Each of these steps is discussed below.

Baseline records. The first step is for the parent to complete at least fifteen days of baseline data. This is done on the Toilet Training Recording Form shown in Figure 1. At the top of the form are two blanks for the child's name and the month during which the recording is taking place. Immediately below, across the top, are a series of numbers from 1 to 31 which represent the possible 31 days of the month. Thus, each form is designed to provide toilet training data for one month. On the left hand side of the form are a series of times divided into half hour blocks running from 7 a.m. to 9 p.m. representing waking hours of the child. Thus, the Toilet Training Recording Form allows the trainer to chart the child's behavior by half hour intervals per day.

There are essentially four coding symbols utilized on the form - a zero, a cross, a dot and a triangle (see Figure 1). The zero represents urination, the triangle represents bowel movements, the

cross represents the fact that the child is on the toilet, and the dot represents when the child receives liquids. A zero without a cross means that urination occurred off the toilet; a triangle without a cross means that a bowel movement occurred off the toilet. A zero with a cross or a triangle with a cross means that the elimination occurred on the toilet - the behavior we are trying to achieve. A cross by itself means that the child was placed on the toilet but neither urination nor bowel movement occurred.

Therefore, utilizing the Form, the parent and teacher involved are asked to record daily data on the child for at least a fifteen day period prior to inauguration of a toilet program. This recording is called baseline data. Ideally the parent during this period should check the diapers of the child every half hour. For those parents who find the half hour check too intensive, a check every hour will be sufficient but may well delay the initial success once the training program commences.

Figure 2 shows a chart that has been completed over a fifteen day period. The mother has recorded those times when the child urinated, had a bowel movement, and/or was given liquids. There are naturally no X's recorded on the chart at this time since the child has not been placed on the toilet. The blank boxes on the chart represent those times when the child was dry. In addition, the mother has included information about when the child is napping and when she had her meals. This is optional information but may be helpful when prescribing the program. She has inserted the letter M for a meal and an arrow indicating the nap period.

Choosing training times. Given this baseline information, the parent is now ready to choose those times during the day when toilet training should be provided. Parents should choose *two* periods of the day when the child has most consistently been found to urinate during the baseline period.

In our example (Figure 2) you will notice that Susan was wet every morning from 7 to 7:30 but this is when she awakens and is, therefore, not a good time to choose for training, because we really do not know when the child urinated during the night. The period at 9:30 should be chosen because the child urinated 9 out of the 15 days during that particular time. Likewise, the period at 4:30 should also be selected, because the child urinated 8 of the 15 days at this time.

Name _____ Month _____

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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Coding Symbols:

O = Urination Off Potty

⊗ = Urination On Potty

△ = Bowel Movement Off Potty

⊠ = Bowel Movement

X = On Potty; Nothing

● = Liquids Given to Child

Daily Comments:

Figure 1

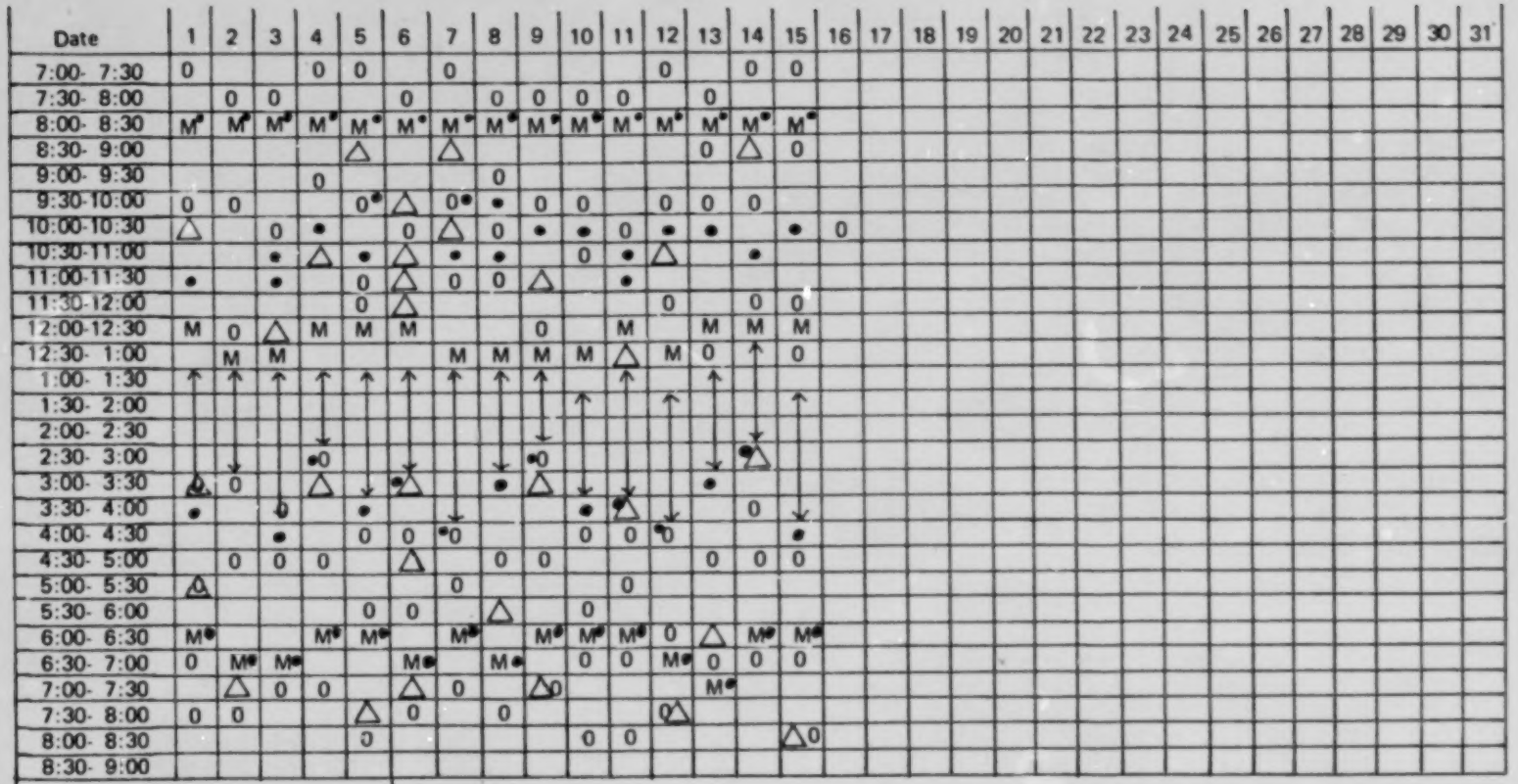
Toilet Training Recording Form

2-171

501

502

Name Susan Month March



Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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3:30- 4:00	•		0		•		↓			•	△	↓		0	↓																
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7:00- 7:30		△	0	0		△	0		△0				M																		
7:30- 8:00	0	0			△	0		0				0△																			
8:00- 8:30					0					0	0				△0																
8:30- 9:00																															

Coding Symbols:

0 = Urination Off Potty

X = Urination On Potty

△ = Bowel Movement Off Potty

✡ = Bowel Movement

X = On Potty; Nothing

• = Liquids Given to Child

Daily Comments

2-173

503

504

Figure 2
Baseline Chart

Often, however, baseline data may not be as clear as it appears in Figure 2. Figure 3 shows a child's baseline data where the child is not as consistent as the child shown in Figure 2. In fact, the most frequent urination time is 4 out of 15 days at 3:30. The best alternative available for this parent is to continue collection of another 15 days of baseline and attempt to regulate the time liquids are given. There may also in this particular case be a suspicion that recording is not as conscientious by the parent because of the numerous obvious omissions of data. Notice the lack of entries for any urination for half day period and the lack of liquid entries. In this type of case the extended baseline period with additional data usually provides a clearer picture of the child's performance.

Erratic data such as those shown in Figure 3 are frequently explained by unusual circumstances. Such factors as illness, disruptive family routines, house guests, or visits to other homes may cause data to be quite variable. Certainly the person advising the parent should attempt to determine whether any of those conditions existed during this baseline period. If the time of these unusual circumstances can be isolated, they can be removed from the baseline and the remainder of the baseline data examined for a pattern. However, an additional fifteen days of baseline is the preferred approach in order to produce sufficient data to pick most probable times of success. There is always a tendency to institute a program even though the data are inconsistent, but experience has shown that such a tendency almost invariably results in an unsuccessful program.

Name Al Month April

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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Coding Symbols:

0 = Urination Off Potty

X = Urination On Potty

△ = Bowel Movement Off Potty

X = Bowel Movement

X = On Potty; Nothing

● = Liquids Given to Child

Daily Comments:

Figure 3
Baseline Chart

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Choosing reinforcers. Having gathered baseline information, the parent is almost ready to begin the toilet training program for the child. However, another bit of information is necessary in addition to the baseline data —— the determination of what reinforcers will be utilized in the toilet training program. Reinforcers can be anything that the child likes —— playing with a favorite toy, candy, ice cream, being tickled, listening to a favorite record. The reinforcer will vary with each child. Be sure, however, when picking the reinforcer that it is one of the most powerful things for the child. For instance, the child may respond very well to tickling and to praise, but s/he really likes ice cream more than anything else. Ideally, ice cream will be the thing to give the child if s/he has success on the toilet. Whatever the reinforcer, it must be restricted to toilet training only and must not be available during other parts of the day. Many parents are concerned about utilization of reinforcers other than praise, because they believe that they will be giving the child ice cream for as long as s/he is going to the potty, but this is not so. It is not true that we will leave the child with these reinforcers that are artificial or exaggerated for any great length of time. Perhaps an example quoted from a book written by two of the authors of this paper may illustrate the procedure that will be followed with the elimination of these artificial or exaggerated reinforcers (Baldwin, Fredericks and Brodsky, 1972).

"When building a bridge, we have to use enormous supports until the cement dries. The same is true with children. We often have to use exaggerated ADULT REINFORCERS that can work by themselves. Sooner or later we shall have to take the exaggerated support out of our system for we cannot leave the scaffold on the bridge nor can we leave the child in the condition where s/he is dependent upon rewards and goodies for everything s/he does. We have used these exaggerated reinforcers to get behavior started and to become stable. Once this is accomplished, we must pull these exaggerated reinforcers out of the system. If we pull them out too fast, the behavior and the bridge will both lose strength. Children have many more complex qualities than bridges have, so as we begin to withdraw the exaggerated reinforcers from a particular behavior, because it is becoming stable, we can now use the exaggerated reinforcers on a new behavior which we wish to strengthen. We call this withdrawal of the exaggerated reinforcer "fading". In other words, once we get the behavior going, we use only the ADULT REINFORCERS occasionally and we try to let the child develop self-satisfaction out of the job s/he has now learned to do. We save our child's reinforcers for other new behaviors that we decide to teach the child.

"An example may illustrate this last point and how fading works: One of our authors, who was conducting many classes with parents, was met one evening upon returning home by his wife holding the hand of his two-year old son.

"This is your son," she said, "he is not toilet trained. You teach all these parents how to toilet train their children. How about toilet training your own?"

"Our hero, whose alias for this story will be SAM, knowing that his professional reputation was at stake, valiantly approached the task under the critical eye and tongue of his wife. Following the procedures prescribed in our toilet training chapter, Sam first determined when Junior was most likely to "go potty". He then sat him on the potty at that time.

"Sam waited patiently by the door for the tell tale sound of the urine hitting the potty. At last it came—— and with it Sam delivered the reinforcer which he felt Junior would most appreciate.

"First he let out a cheerful, "That-a-boy, Junior" (social reinforcement, exaggerated); then he flashed the bathroom lights on and off rapidly (tangible reinforcement); and finally, because both Sam and his son are part Indian, Sam performed an old tribal war dance with appropriate war whoops. Junior loved it! This ritual was repeated each time Junior went to the potty as he was supposed to.

"Time passed with an increasing number of successes and Junior began to tell Dad that he had to go potty. Sam realized that it was time to begin the fading process. The first thing Sam pulled out of the system was the flashing bathroom lights. The exuberant "That-a-boy, Junior" and the Indian War Dance remained. Gradually, however, the war dance became shorter and less intense, and before long it was only one war whoop. Then the social praise became less enthusiastic, and Sam began to position himself away from the bathroom door where Junior could not see him. Junior then had to say, "I'm done, Dad," and Sam would reply, "Good". Before long, no longer was the "Good" even necessary. Junior was toilet trained and was going "potty" by himself because he knew it was the thing to do.

"Thus, a period of training began with some very exaggerated child reinforcers. As the child demonstrated he could do the behavior, the child reinforcers were gradually reduced and in place were established ADULT REINFORCERS."

Conducting toilet training. And so, after the parent has picked the reinforcer, has the baseline data, and has chosen two times during the day in which to attempt to toilet train the child, the toilet training process is ready to begin. The procedure to be utilized is as described below:

Place the child on the toilet at the designated time for a period of ten minutes. While the child is on the toilet, do not make this a play time or a time to be playing with various objects. If the child has difficulty sitting on the toilet or refuses to do so, this will require a special program and will be discussed under "Special Problems" later in this paper. The parent should be in the room or at the door of the room, listening intently, because if there is a urination or bowel movement, the child should be *immediately* reinforced with the reinforcer that has been chosen. If at the end of ten minutes the child has not performed on the toilet, remove him/her from the toilet without either criticism or praise, put on his/her diaper, and have him/her resume activities for a period of five minutes. At the conclusion of that five minute period, put him/her back on the toilet for a period of five minutes. Again, listen and be prepared to reinforce. Should the child not perform at this time, take the child off again without criticism or praise and return him/her to his/her diaper. After such a sequence the trial has ended and an X is placed on the toilet training chart.

The parents should, during this toilet training time, also record as well as they are able the child's performance during the remaining part of the day. In other words, the toilet training chart should be maintained as it was during the baseline period, because after the child begins to achieve successes at the times designated, other times during the day will be selected; the continual maintenance of the charts allows an easy selection of those times.

Expanding training. Parents now continue to toilet train the child at the two designated times each day. When the child achieves 75% success at either of the two times for a ten day period, an additional time during the day is added for toilet training. (Parents who achieve success rapidly under this method or who are anxious about having the child toilet trained at a more rapid rate than this method espouses, may now pick more than one additional time and may add as many as three or four times. They must understand, however, that this is a major commitment of time - at least ten minutes for each time that they pick and perhaps as long as twenty minutes (i.e., 10 minutes on, 5 minutes off, followed by 5 minutes on). Our experience is that parents frequently do not have this type of time to devote to the toileting training process.) Reinforcers previously determined should be maintained for the additional toilet training period. In fact, it should be emphasized again that the reinforcer be utilized *only* for toilet training, and thus, especially if it is a powerful reinforcer, it will gain even more power in this very important area.

Thus the process continues as the parent gains success during each time in the day - that is 75% success for a ten day period, for each successful period an additional time during the day is added until all periods of the day are covered and the child is achieving 75% success throughout the day in eliminating on the toilet. Ten successive days at this rate is desirable.

Indicating need. After the child achieves a 75% success rate throughout the day, s/he is ready to be taught to indicate his/her need to go to the toilet. This expression of need may well have been occurring prior to this time and if so, this is all well and good; but frequently it is necessary, especially with the more severely retarded child, to teach this as a separate behavior.

The process to use to teach the child to indicate his/her desire to go to the toilet is as follows. The parent is standing near the child when s/he urinates or defecates and says "Oh, Johnny has gone to the toilet!" or "Johnny, has tinkled!" or some other expression which the parent decides is appropriate for the child to use to communicate. We do not specify what is the best phrase or expression, since it seems to be peculiar to each family, and many people who have raised other children utilize the same expression with their handicapped child that they used in the training of the other children.

As the child urinates or defecates, the parent verbalizes this and the child is asked to repeat the phrase. In other words, the parent says, "Johnny is going potty" and the child repeats "Johnny is going potty". If the child is unable to verbalize, a sign or signal should be arranged between the parent and child. We know of one parent who used the signal of "thumbs up", making a fist with the thumb extended up, that indicated that the child went potty. The child was then taught to use that sign. Certainly the standard manual deaf language sign would be appropriate; inserting the thumb in between the index finger and the middle finger and rotating the fist to indicate "toilet" is an acceptable cue.

When the child is repeating the cue of the parent successfully, it is time to have the child answer the "what" question. "What are you doing, Johnny" and Johnny either answers "I am going potty" or he gives the sign or the signal. Once he does this successfully, he should be asked the question prior to going to the bathroom, "What are you going to do, Johnny?" The response to the question is "I am going to the potty."

Of course, each time the child delivers the verbalization or sign correctly, s/he should be reinforced. The goal, of course, is to have the child verbalize when s/he wants to go potty and this should be reinforced when the child does so. Verbalization and requesting to go to the potty is considered to be a behavior separate from the actual behavior of urinating or defecating on the toilet.

Once the child has achieved 85% or 90% during the day, regardless of whether or not s/he is verbalizing the request or desire, night toilet training should begin.

Nighttime Toilet Training

Once the child has achieved 85% or 90% success during the day, it is time to commence nighttime toilet training. The procedures for nighttime toilet training are sometimes even more frustrating for the parents than the daytime procedures. Baseline data should first be taken to determine how many nights the child wets. A ten day baseline period is sufficient. The program consists of four phases.

Phase 1. The first phase of the nighttime toilet training procedure is to insure that the child goes to the bathroom prior to retiring for the evening and to tell the child if s/he is dry during the night that s/he will receive a reward, a surprise, or treat the next day. This is certainly the simplest way to do night toilet training, but this method is not always successful. In those instances when it is successful, it is worth the simple procedure and requires little effort on the part of the parents. This phase should be repeated for ten days. If no difference in the child's performance is noted after ten days, Phase II should be initiated.

Phase II. During this phase reduce the fluid intake of the child for two hours prior to bedtime. Again tell the child that s/he should be dry during the night and again offer the treat, surprise, or reinforcer for the next day. Again, try this for a ten day period. If there is no improvement in the performance of the child, go to Phase III.

Phase III. This phase requires reduction of fluid intake and waking the child to go to the toilet before the parents retire. If the child is dry when the parents wake him/her, they should reinforce him/her. In addition, if s/he urinates upon being taken to the toilet, s/he should receive additional reinforcers. Try this for a period of ten days. If there is no success when the child is awakened or if the child is wet in the morning even though s/he eliminates when awakened, go to Phase IV.

Phase IV. This phase requires a determination of when the child wets at night. If the child is wet when the parents wake him/her in the evening during Phase III, the solution, of course, is to wake him/her earlier in the evening. If the child is still dry and eliminates when awakened but then wets again during the night, the parents must pick a time half way through the night, wake the child and have him/her eliminate. If the child is wet when s/he is awakened half way through the night, the

procedure then is to wake him/her midway between when the parents went to bed and the time that they originally chose to awaken him/her half way through the night.

A couple of examples may suffice to explain this more clearly. Take the case of Jane, who went through the procedure of being told about a reinforcer, reduced her fluid intake, was awakened before the parents' bedtime, but was still wetting during the night. The parents usually retired at 11:00; Jane usually wakened in the morning at 7:00; thus there was an eight hour period of sleep. The parents divided the night in half (four hours), set their alarm at 3:00 and woke Jane at that time. Jane was wet for the first five nights that they awoke her. The parents then decided to awaken Jane at 1:00, half way between 11:00 and 3:00. Awaking her at that time, they found that Jane was dry. If she had been wet, they would have awakened her at 12:00. However, since she was dry they had her go to the bathroom and eliminate. This procedure succeeded in keeping her dry for the entire evening.

Billy's parents and Billy had sleeping hours similar to Jane and her parents. In the case of Billy, however, when the parents awakened him at 3:00, they found that Billy was usually dry. He would eliminate at that time and remain dry for the rest of the night.

Now that a procedure has been found to keep Jane and Billy dry, a procedure must also be established to eliminate the parents getting up in the middle of the night to wake the child. Consequently, in the case of Jane who had to be awakened at 1:00, the parents would awaken her ten minutes earlier each night, keeping track to ensure that she remained dry. In the case of Billy, the parents awakened him half way through the night. The rule of thumb is that if the child is wet half way through the night, then you shape him/her by gradually moving the time that s/he is awakened closer to the time that the child goes to bed. If the child is dry, you gradually move the time closer to the time that the child gets up in the morning.

The important thing about night toilet training, just as with daytime toilet training, is to ensure that there is a powerful reinforcer for being dry. When awakening the child during the night, social reinforcement should be delivered for eliminating or being dry. The promise of additional reinforcers the next day may well accelerate night toilet training. The authors have successfully used such things as stars, special desserts, special time with Mom, playing with a particular toy and television time.

Special Problems

There are a number of special problems which frequently are associated with toilet training. Unfortunately, a paper such as this cannot deal with all the possible problems which arise, but this section will deal with those that are most common.

The "refuse to sit on the toilet" child. One of the most common problems is that of the child who refuses to sit on the toilet. The parents must then teach the child to sit on the toilet before they commence toilet training. The most extreme case, of course, is the child who screams even when brought into the bathroom and placed anywhere near the toilet. In this case, the child should be walked to the door of the bathroom and reinforced at that point. After s/he does that three times in a row without crying, then lead the child about a foot inside the door and reinforce. Again, do this three times in a row, before requiring the child to proceed a foot closer to the toilet. Continue the program in this manner until the child is able to walk to the toilet without crying or tantruming. When the child reaches the toilet, have the child touch the toilet and reinforce. Have the child do this three times in a row without crying. Next have the child sit on the toilet with the top cover down and reinforce. Do this three times in a row. Then have the child sit, fully clothed on the toilet with the top cover up and again reinforce. This behavior also must be performed three times in a row successfully. Finally you are ready to have the child sit on the toilet with his/her pants down, reinforcing him/her for this sitting. Initially let him/her sit for a few seconds, reinforce him/her, and let him/her off. Once s/he is doing this without a fuss, then gradually extend the time in ten to fifteen second increments until the child is capable of sitting on the toilet for a period of at least five minutes without a fuss. When s/he is able to do this, the child is now ready to be toilet trained.

The child who is not "making" it. The second most discouraging special problem is voiced by the parent who says, "I have done everything that you told me, and my child is not making it." At this point we would recommend to the parent, if in fact they have done everything that has been

recommended, that they abort toilet training for a period of about thirty days and then go back to it. They may have to repeat this process a number of times, but they will eventually achieve success. One of the principles that we have learned over the years is that a teacher or a parent, who has used the most powerful reinforcers and has followed a program that has been prescribed for which no further modifications can be made, must not hesitate to abort that teaching program, for they are only keeping the child and themselves in a failure situation which is frustrating to both the teacher or parent and the child. Thus, the temporarily aborted program is a viable alternative in those cases where the teacher has manipulated all the variables, namely the consequences, the cues, and broken the behavior down as much as possible. And the same thing will hold true for toilet training. If the parent has provided the program as specified herein, s/he is providing the most powerful reinforcers known, and is going for a period of 30 days without a success, then it is time to abort the program and take a 30 day break before restarting it again.

The child who reverts. The third most discouraging problem that is frequently seen is that of the child who has essentially been toilet trained but who suddenly starts to revert back to wetting his/her pants and seems to be losing ground instead of gaining it. What has occurred here, more often than not, is that the parent has begun to fade out the reinforcers that they have given to the child for success on the toilet. The solution, of course, is to immediately reinaugurate the reinforcer. Fading it out will have to proceed at a slower pace.

If the reinforcer has still been in existence, but the child has reverted, examine the reinforcer to determine if more powerful reinforcers may not now be required. A child who is given a reinforcer when the toilet training begins is growing and changing and with that growth and with that change other things become more reinforcing for the child. Consequently, the reinforcer needs to be changed. A final point to be investigated is whether the parents are consistently following the program. A toilet training program may span months, and consequently, it is easy to see how parents might gradually become inconsistent in following the prescribed program.

The child who smears. One of the behaviors that we occasionally see in retarded children during toilet training is that of feces smearing either on the wall or on the child's body. No one has been adequately able to explain why children do this. It is extremely disturbing to the parent and to others who happen to come in contact with the behavior. Our recommendation in this particular case is to take baseline on how frequently it occurs. Then punish whenever it does occur. Continue to count it; determine whether or not the frequency of its occurrence is lessening as a result of the punishment. If the frequency is not lessening the punishment is not effective and other punishers may have to be inaugurated. Contrariwise, the parent should reinforce the child for periods when no feces smearing occurs. Let us take the example of the child who smears feces on an average of once a day. The parent may decide to punish him/her by spanking whenever it occurs, but must also reinforce the child every half day with a special treat and a big fuss whenever the feces does not get smeared. Reinforcement combined with the punishment may adequately stop feces smearing.

Summary

We have presented a toilet training procedure for both daytime toilet training and nighttime toilet training and we have discussed some of the more common special problems related to toilet training. In each of these training programs and in dealing with the special problems, we have emphasized the importance of reinforcers for the child. The idea of reinforcing a child for correct toilet training habits is extremely important and cannot be overemphasized, because it becomes the key to success. In only one instance do we recommend punishment, and that is in the case of the child who is smearing feces. It should be emphasized that we are not recommending punishment for failure to eliminate in the toilet.

The procedures described herein are designed to be a simplified method which parents may follow to eliminate most of the frustrations that go with toilet training a retarded child. The procedures do not promise quick results, but they promise steady progress. Quicker results can be obtained if the parent is willing to put further effort into the program. The program described is a minimum effort. Parents may add to it as they wish and may subsequently speed up the process of toilet training.

This program has been tried over a period of seven years with numerous retarded children. Their parents have found it to be a successful method for toilet training their children.

References

Baldwin, V. L., Fredericks, H. D. and Brodsky, G. Isn't it Time He outgrew This? or a Training Program for Parents of Retarded Children; Springfield, Charles C. Thomas, 1972.

Baumeister, A. A. "Learning Abilities of the Mentally Retarded" in Mental Retardation, edited by Alfred A. Baumeister. Chicago, Aldine Publishing Company, 1967.

Baumeister, A. and Klosowski, A. "An attempt to group toilet train severely retarded patients", Mental Retardation, 1965 Vol. 3 No. 6; pp. 24-26.

Bensberg, G. J.; Colwell, C.; Tassel, R. H. "Teaching the profoundly retarded self-help activities by behavior shaping techniques" American Journal of Mental Deficiency, 1965, Vol. 69, No. 5; pp. 674-679.

Foxx, R. M.; Azrin, N. H.; and Sneed, T. J. Champaign, Illinois, Research Press, 1973.

Foxx, R. M.; Azrin, N. H.; and Sneed, T. J.; "Dry bed training: rapid elimination of childhood enuresis", Behavior Research and Therapy, September, 1974.

Hundziak, M.; Maurer, R. and Watson, L. S. Jr.; "Operant Conditioning in Toilet Training of Severely Mentally Retarded Boys", American Journal of Mental Deficiency. 1965, Vol. 70, No. 1; pp. 120-125.

Kimbrell, D. L.; Luckey, R. E.; Barbuto, P. F. P.; Lowe, J. G.; Operation Dry Pants: An Intensive Habit Training Program for Severely and Profoundly Retarded, Abilene, Texas. Abilene State School, 1966 (mimeo).

Sloop, E. W. and Kennedy, W. A. "Institutionalized retarded nocturnal enuretics treated by a conditioning technique", American Journal of Mental Deficiency, May, 1973.

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FEEDING ASSESSMENT AND THERAPY FOR THE NEUROLOGICALLY IMPAIRED

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Abstract. This paper is concerned with a therapeutic approach to problems in feeding children with abnormal muscle tone and poor muscle coordination. Feeding therapy is intended to promote normal sensorimotor experience and maximum independence during feeding, as well as to assist in meeting the basic nutritional requirements of the neurologically impaired child. With regard to the goals of therapy, attention is given to means of assessment, intervention, and treatment. The Eating Assessment Tool is presented as an instrument for measuring progress in feeding behaviors.

The following discussion is focused primarily on children with neuromuscular incoordination and abnormal muscle tone. Much of the information could apply to adult rehabilitation and facilitation of normal feeding in mentally retarded individuals. "Feeding therapy" means more than satisfying the basic requirements of nutrition for growth and health. Feeding therapy means promoting normal sensorimotor experiences within the mouth and the entire body during feeding so that maximum independence can be achieved. Many benefits result from this therapy, including: (a) a more pleasurable mealtime experience for child and parent; (b) elimination of health hazards such as choking or inadequate food intake due to swallowing difficulties; (c) improvement in total body coordination by reducing effort involved and reinforcing physical therapy goals; (d) facilitation of speech through improved oral musculature coordination; and (e) a decrease in feeding behaviors unacceptable to the general public.

Therapy goals are not achieved overnight, especially when the abnormal patterns are well-established from years of reinforcement. However, some changes for the better should be observable very quickly if the treatment program is appropriate.

Background Information

The initial feeding assessment should be done by a physical, occupational, or speech therapist with specialized training in neuromuscular disorders. An assessment of the child's overall skills and limitations is usually done first to determine the influence of pathological or primitive reflexes. An understanding of how gravity, posture, effort, and emotions affect muscle tone is important during the assessment and treatment planning. A good resource on this subject is Finnie (1975).

All professionals and parents who provide care for neurologically impaired children should be familiar with some basic principles. Abnormal muscle tone is the primary cause of feeding problems. It interferes with muscle coordination and with tactile and proprioceptive sensation. Proper muscle coordination is dependent upon accurate proprioceptive and tactile information. We have good reason to aim for normal muscle tone during intervention, so that we can break up the abnormal cycle and start building a positive learning experience.

Abnormal muscle tone occurs in different ways, depending on the location and extent of damage to the central nervous system. The abnormal muscle tone may be expressed in the following ways:

1. Hypotonia (floppy, slow or absent righting, equilibrium, and protective responses, affects the entire body);
2. Hypertonia (stiff, may affect all or only part of the body, when behavior is dominated by lower CNS structures early in infant development the only symptoms may be delayed motor development and low muscle tone; as higher centers are activated, and the CNS disorganization becomes more apparent, increased muscle tone occurs); and
3. Fluctuating muscle tone (simplified classification of several types of cerebral palsy requiring a similar treatment approach, muscle tone fluctuates to various degrees of hypotonia and hypertonia).

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Hypertonia occurs in patterns which are influenced by (a) the limb positions in relation to the body, and (b) the body position in relation to gravity. The most important way to inhibit high muscle tone is to avoid the abnormal patterns. The most common patterns in which high muscle tone occurs are as follows:

1. Extensor pattern (extended legs held close together, spine extended, arms pulled back at the shoulders, elbows stuck in flexion or extension, head pushed back; jaw thrust and tongue thrust may also be seen as part of this pattern). Gravity makes this pattern stronger when the child is on his/her back and less strong when s/he is upright or lying on his/her side. Often when this pattern is present, the flexor pattern is also present to some degree.
2. The flexor pattern (legs may be flexed, knees apart, spine flexed, arms flexed, hands fisted, head pulled forward; the bite reflex is part of this pattern but may not be present.) Gravity makes this pattern stronger when the child is prone and has less influence when the child is upright or lying on his/her side. The flexor and extensor patterns are reciprocal so it is important not to try to induce one as an antidote for the other —— neither one is functional.
3. The asymmetrical tonic neck reflex (face is turned to one side, limbs on that side tend to flex, limbs on the other side tend to extend, the back tends toward curvature, especially if the pattern is consistent towards one side).

A discussion of how to avoid these patterns will be included in the section on "intervention." Muscle tone also increases with effort and emotions (stress, excitement). Therefore it is important to be aware of environmental and emotional factors. Self-feeding might be limited to part of the meal if the effort causes an increase in muscle tone which interferes with muscle coordination.

Case Finding

The first step is to recognize a problem. When a child has a long history of abnormal feeding patterns, parents may not be concerned about changing them or they may not realize that any change is possible. Patterns which indicate that a feeding assessment is required are:

1. Choking and coughing more than once or twice during each meal.
2. Inability to keep most food and liquid inside the mouth and swallow it.
3. Tendency to bite down hard on the spoon.
4. Intolerance of solid foods beyond the developmental age of 6 to 9 months (inability to chew, choking, tactile sensitivity).
5. Abnormal sitting posture (i.e., head tilted back or to the side, body tilted laterally, etc.).
6. High muscle tone.
7. Great effort expended by parent or child resulting in unpleasant mealtimes.
8. Persistent tongue thrust beyond the age of 6 months (in and out movement of the tongue); usually goes along with inability to chew, choking, and other findings.

Many children will have several of the above mentioned problems or possibly others interfering with food intake. The next step is assessment.

The Assessment

The best place for the first assessment to take place is in the child's home, with one of his/her parents feeding him/her small portions of a typical meal. In addition, small portions of food which offer a variety of texture, consistency, and temperature can be offered.

The Eating Assessment Tool (E.A.T.) was developed by this author very recently for the purpose of providing a measurement of progress. I attempted to make it simple, yet comprehensive; I have not used it enough to know how much time it will take to score. After the initial assessment has been done in full, and the focus of treatment selected, it might be most useful to use only part of the test to periodically measure progress in a specific area of concern. The instructions and explanations are important for proper use of the tool.

The following comments follow the outline of the Eating Assessment Tool (Appendix A).

I. It is important to observe the child's posture first. Ask if there is more than one way the child is positioned for eating and which way is most typical. If s/he is not sitting upright, estimate the

angle between horizontal and vertical. If the child does not look symmetrical with the head upright, describe. What kind of physical support is provided (under "adaptations")? Comment also in this section on the child's overall muscle tone.

II. When evaluating oral skills, be aware of which body positions trigger pathological patterns. Also notice differences in how foods of various textures are handled together with the relative difficulty of various types of food. It may be difficult to translate your observations of abnormal feeding behavior into the positive scoring method of this test. You may want to write down your observations of abnormal patterns in detail, perhaps including counts of certain behaviors (i.e., choking or bite reflex or jaw thrust) so that you can compare later test observations in these respects. However, it is still advisable to score the test as written so that you can determine its value as a measure of progress. Ask parents about the child's daily dental hygiene and whether they have located a dentist for their child. Note condition of child's teeth and gums. Dilantin, a common seizure medication, causes swollen gums; good oral hygiene becomes even more important to prevent gum tissue and tooth enamel damage. If the child is taking Dilantin medication, the family should be aware of the need for an increased intake of Vitamin D, the dosage levels to be determined by a physician (Pipes, in press).

III. Assessment of eye-hand coordination as well as total postural control will help determine the practicality of teaching self-feeding or on what level this might begin. If the child can bring the hand to the mouth and maintain grasp on an object once it is put in his/her hand, s/he can begin to experience "self-feeding" with long narrow pieces of food such as toast, baby cookies, chicken leg bone (the meat removed gives flavor and teething experience primarily).
Some of the items are subjective and not well-defined; therefore, comments would be especially appropriate. Item number 40 means that most of the food ends up inside the child rather than spread on the table, floor, and clothes. Sticky hands and face are considered acceptable and within my definition of "neat."

IV. Assessment of the feeding behavior and environment will require asking questions of the parents. In addition, however, make your own observations of the emotional tone and interaction pattern between parents and child. Is it stressful? Is mealtime a pleasurable experience for parents and child? Is there any verbal or non-verbal communication and what is the tone? This will require your assuming a non-intrusive role. Ask if the observed behavior is typical or if any differences were perceived.

V. Does the parent perceive problems or desire changes? If not, who does and why? Feeding skills may vary in different situations depending on the excitement level of the environment, the skills of the feeding assistant, hunger, and the anxiety or emotional level of the child.

If the parent does not see the need for change and you do, discuss your concerns and ask permission to start a therapy program without asking for any commitment from the parents until you can convince them that the effort will be worthwhile (this is assuming that you will have daily contact with the child through school). You may want to ask for partial participation, that is, trying your ideas for part of each meal in order to obtain feedback about how successful or non-successful these methods are. When things are not going well at home, another evaluation may be necessary in order to see that instructions are clearly understood and properly used without frustration or discomfort.

The Treatment Plan

Once the assessment is done, how do we determine treatment priorities? The highest priority, it seems to me, should be maintenance of health. This includes reducing incidences of choking and improving quality and quantity of nutritional intake if necessary (see "Foods and Nutrition" section).

The second priority is to improve oral-motor patterns and the third is to promote self-feeding skills. At times the second and third priorities have to be weighed in terms of age, that is, self-feeding may be more important to an older child than chewing without tongue thrust. In these cases one might plan a specific time (all or part of one meal) to work on improving oral-motor patterns and then let the individual self-feed. Adaptations may be helpful in improving self-help skills (to be discussed later).

Keep in mind the normal sequence of motor and oral development so that you work on the more basic skills first. The normal developmental sequence of oral control is: (a) coordination of swallowing and breathing, up and down jaw movements with sucking (tongue moves with jaw), lip closure around nipple during sucking (birth to 2 months); (b) forward and back movement of tongue while sucking (similar to the exaggerated abnormal pattern often seen in older retarded and C.P. persons), the child rejects textures (pushes out of mouth), shows beginning head control, some hands in mouth (2 to 4 months); (c) the child has good head control, opens mouth in anticipation, moves head and mouth towards food, accepts strained, soft foods off spoon without much lip closure, frequently brings fingers and toys to mouth, biting and using tongue to explore (important practice for tongue lateralization to move food in mouth and important for normal sensation) (4 to 6 months); (d) about the time a child learns to sit independently s/he begins to feed him/herself finger food (6 to 10 months; starting with total hand grasp of object such as baby toast or cookie); at first the finger food is mouthed and chewed on (usually before the child has teeth) but does not provide much of the child's nutritional intake. As hand coordination improves, a wider variety of foods can be picked up and put in the mouth. Tongue and lip control are also improving with maturation so that lumps can be introduced with only occasional choking occurring (often associated with too much food in the mouth or a mixture of liquid and solid textures). See Appendix B for an example for transition from first foods to table foods.

The normal developmental sequence cannot always be followed with a handicapped child. Head and trunk control are not necessary prerequisites to chewing or self-feeding, but appropriate adaptations must be provided to compensate for lack of those skills. Nor is the ability to lateralize the tongue a prerequisite for the transition to solid foods; just the experience of having solids stimulating his/her gums (with an adult holding the tongue in place at the back and side of the mouth) will stimulate lateral tongue movement. If a child is unable to get his/her hands or toys to his/her mouth to explore, this type of experience (with assistance) should be a part of his/her pre-feeding program to normalize sensation and stimulate a variety of tongue movements. Recognizing the normal sequence may also be a way to discover a specific gap in a child's development, such as persisting immature tongue movements.

Intervention

Choking, a fairly common problem with severely impaired children, has different causes. The first thing to check is the child's head position in relation to gravity. If food falls to the back of the mouth due to gravity, it is hard to coordinate the breathing-swallowing timing and to control the amount of food ingested with each swallow. (Try eating or drinking while lying on your back.) Secondly, look at the child's head alignment with the body —— if the head is tilted back, the airway is open and food can easily go down the wrong tube (try tilting your head back and swallowing; also remember that mouth to mouth resuscitation is done with the head tilted back in order to keep the airway passage to the lungs open). Certain foods cause more choking than others, such as thin liquids versus thick and foods that require a lot of chewing and don't dissolve in saliva such as raw vegetables, peanuts, and meat (see "Foods and Nutrition" section).

When choking does occur, be sure to get the child's head *down before* hitting his/her back between the shoulder blades so that gravity pulls the food out of the air passage rather than lodging in it more securely. Another method is to hold the individual in front of you, his/her back against your front, your hands clasped over his/her diaphragm and pull in suddenly, forcing reserve air out of the lungs to help dislodge the food (assuming that it's too far down to reach or shake out).

Positioning is one of the most important parts of the intervention program. The upright sitting posture is usually best, but may be modified to a slight backward tilt of the chair with head support, if head control is poor. Cut-out foam cushions may be needed to provide trunk or head support. Adaptations to keep a child from sliding out of his/her chair due to involuntary hip extension include: knee separator, foam wedge under knees, slight (30 degrees to 45 degrees) backward tilt of the chair, peroneal straps around each leg, a seat-belt, a rolled up towel under the knees (tied to prevent slipping). The feet should be supported. If the child tends to pull his/her head and arms back (extension pattern) cushions behind the upper arms to keep the arms forward and a cushion behind

the head should help. Also applying some pressure to the child's chest while bringing the arms forward helps reduce the influence of the extension pattern. Sometimes a wide belt around the child's upper arms and across the chest is useful in keeping the arms forward.

There are many different ways to hold a baby or very young child during feeding. The child might sit side-ways on the adult's lap; if the adult's legs are held slightly apart the child has less tendency to slip off, because his/her hips are more flexed. The arms and head can be controlled with one adult arm and the food presented at midline with the other hand. The problem with this method is the tendency to let the child's head slip back too far in relation to the body and to gravity but that can be easily corrected when one is aware of it. Resting the adult's arm on a table often helps. Other feeding positions are discussed in Finnie (1975).

The child should look symmetrical and aligned for optimal functioning and normal muscle tone. If s/he does not, try to analyze how to change the position.

When the child is floppy, postural muscle tone in the trunk and head can be improved by intermittently giving pressure down through the spine via the child's head and shoulders (be sure s/he is aligned properly).

If the child cannot open and close the jaw voluntarily, or if the jaw opens too widely and sets off other abnormal patterns, jaw control by the adult assistant may be necessary. This is usually done with the index finger and middle finger at the chin if done from the side or back; if the assistant is facing the child, the control is provided with the thumb and bent index finger at the tip of the chin. The only disadvantage with the front approach is the tendency to push the child's head back, out of alignment. See the illustration in Finnie (1975). Often simply correcting abnormal posture can help with jaw control (the tendency to open the jaw too wide with extensor pattern and bite down hard with flexor pattern).

Exaggerated primitive tongue movements (in and out) can be inhibited with jaw control and by placing food to the side of the mouth. At first choose foods you can hang on to while the child chews. Placing food to the side of the mouth also works well with small portions of beginning solid foods such as cheese, crackers, cookies, and vienna sausage. Before feeding or intermittently during feeding, stimulate the side of the tongue by pushing firmly or stroking with a tongue blade (expect movement toward the stimulus). A variety of tongue movements is also stimulated when ice chips are placed in the mouth.

Some older children who have exaggerated tongue and jaw movements when drinking liquid from a cup do better with straw drinking and external jaw control. Straw drinking can be taught by using a flexible tube fitted into a flexible plastic bottle so that pressure on the bottle puts fluid in the tube and assures early success. Be aware of the possibility of increased abnormal tongue thrusting; discontinue use of the straw if the oral patterns deteriorate.

If the child has trouble swallowing food once it is in the mouth, try moving the jaw open and closed and waiting for a response, repeating as necessary. If this technique is not successful, some people feel that stroking under the chin (base of tongue) helps. Generally the stimulus for swallowing is pressure on the tongue from food, so pressing down on the tongue with the spoon just before pulling it out will stimulate swallowing (a technique also used to decrease tongue thrusting). Some people suggest that blowing on the face will promote swallowing.

Lip closure can be stimulated in several ways. Tapping around the outside of the lips is one method of "quick stretch" to the muscle. Rubbing ice around the outside of the lips and on the lips as long as tolerated (about 20 seconds; avoid discomfort, watch for clues) before a meal will also stimulate lip closure, Battery operated vibrators are also used. Some people have suggested using lemons or pickles to promote the pucker.

Chewing can be facilitated by helping the up and down jaw movement get started, but never try to facilitate the rotary component of chewing. It's much too subtle and will develop spontaneously when tongue lateralization during chewing is developed. The stimulus of pressure of food on the teeth is the key to the chewing response. Jaw closure can also be stimulated by tapping on the chin.

The rejection of solid foods by the child may be based on primitive protective responses. Very often tactile and proprioceptive sensation is impaired (remember how difficult it is to chew after novocaine?) but can be remedied through graded application of stimulation to the inside of the mouth. Rubbing your finger firmly on the child's gums twice from midline to the back of both sides,

top and bottom, allowing time to swallow between each stimulus is a helpful pre-feeding exercise.

An example of gradual transition from mushy foods to solids is seen in Appendix B. It is usually best to introduce new foods and textures in small quantities at the beginning of a meal before offering the easily accepted foods, gradually increasing the amount and variety of new foods. This is *not* going to work with all children. Some children seem to do better with total elimination of "baby" foods when soft solids are first introduced. If a child seems to have a hyperactive gag reflex (stimulation on the front part of the tongue produces a gag response which is supposed to occur only with stimulation way back on the tongue) start reducing the sensitivity by touching firmly with a tongue depressor on the lips, then tip of tongue, slowly working back further on the tongue as it is tolerated, over a period of time. Flexing the head forward as the child starts to gag will usually stop the response. Behavior modification is also often necessary because the gag response usually has elicited a lot of attention from others in the past.

Drooling can be a result of lack of lip closure or jaw closure, poor sucking, low tactile sensation, or mouth breathing. Finnie (1975) suggests that firm pressure between the nose and upper lip be applied periodically throughout the day in order to stimulate mouth closure. Sucking on popsicles or ice chips will improve sensation and the use of tongue and lips. Tapping on the chin or cheeks will facilitate jaw closure. Frequent use of straws may also help. You might also have the child practice breathing through the nose for short periods of time and increase the length of time. Behavior modification procedures are also very helpful in promoting change. Learning to hum songs may be helpful for the child.

If the child tends to push his/her head back, it is helpful to approach him/her slowly with the spoon or food and stop short of his/her mouth, encouraging head movement forward to get the food off the spoon. Try not to lift the handle of the spoon up when pulling it out — rather pull it straight out. Drinking from a cup with a space cut out of the rim at the top as described in Finnie (1975) or drinking with a straw will eliminate the necessity of tilting the head back. A straw that fits inside a baby bottle nipple can be used for babies so that they can sit with head slightly forward holding the bottle down instead of propped up.

Self-feeding can be initiated as soon as the child can handle food in the mouth with normal muscle tone. Interest in food is an important motivational factor. The adult can assist the child by holding his/her hand or elbow as necessary, withdrawing assistance as the child is able to take over. This can occur for part or all of the meal. If the child has difficulty with voluntary grasp and release, a bread stick or other long, thin food can be placed into his/her hand. Children often are able to bring a spoon with food to the mouth before they are able to load food onto the spoon so the adult can assist with that. A variety of adaptations can be made or purchased including spoon handles, rimmed plates, non-slip placemats, and a wide variety of cups. The bowl of the spoon should fit into the child's mouth easily. Curved handles are helpful to some children and are designed to be used with only the left or the right hand, depending on the direction of the curve. A simple sandwich holder using a rubber band for tension can make it possible for a child to take several bites before the sandwich needs to be relocated if his/her own grasp might squeeze the sandwich too hard.

Parent participation is very important; they should be encouraged to share their ideas and observations in a problem-solving team approach. The basic principles affecting muscle tone should be taught at the beginning, so that parents can readily assess which positions and approaches work best for their child. Many of my ideas come from parents who have tried a variety of approaches to see what works best. It is a good idea for everyone involved in feeding the child to use basically the same approach and expectations. Periodically these people should be questioned about how they feel things are going; difficulties can then be corrected early. A solution may be as easy as finding a more comfortable position for the adult, or adding support for the child's posture.

Foods and Nutrition

The parents should list foods that the child likes, dislikes, or has difficulty with. Start therapy with foods the child likes, then introduce new foods, perhaps alternating them. In general, the following guidelines are offered:

Liquids are easier to handle when thickened (buttermilk, thinned yogurt, thinned apple sauce or

pudding, milkshakes, gelatin or instant pudding added to liquids for thickening purposes).

Multi-textures such as vegetable soup, apples, watermelon, and grapes that involve handling thin liquid and a solid are most difficult. Also foods that don't dissolve such as raw vegetables, peanuts, popcorn, and meat are most difficult.

Taste, temperature (warm or cold vs. room temperature), and texture stimulate chewing and swallowing. Foods with a crunchy quality that dissolve fairly easily, such as crackers, cookies, breadsticks, dry cereal, and toast strips, give good sensory stimulation and are safe. Other beginning finger foods include: fruit leather, beef jerky, meat cut with the grain in strips, licorice sticks, cheese sticks, and popsicles. Many children enjoy holding a chicken, turkey, or beef bone and gnawing at it.

Many neurologically handicapped children start slowing down in growth rate by 2 years of age (Pipes, in press). This usually has nothing to do with their adequacy of nutrient intake, but rather seems to be related to the neurological damage. If the child's height and weight correspond roughly on the growth grid charts, then there is usually no reason to worry.

There are many questions that arise that only a nutritionist can answer. The areas of concern include: (a) marked discrepancy in height and weight (fat or skinny); (b) limited variety of food intake; (c) unusual family diet; (d) need for supplemental vitamin D when taking Dilatin seizure medication; and (e) restricted diet due to allergies. Other guidelines are listed in Erickson (1976; Chapter 9).

Summary

Feeding therapy promotes normal sensorimotor experience within the mouth and the entire body during feeding so that maximum independence can be eventually achieved. An understanding of how gravity, posture, effort, and emotions affect muscle tone is important during the assessment and treatment planning. Positioning is one of the most important parts of the intervention program, due to the effect this has on muscle tone. The attitude of the child's assistant must be relaxed and friendly and calm to avoid hypertonus related to emotions. The feeding environment should also be assessed in relation to the child's needs. Attention should be directed toward developing normal oral-motor patterns before encouraging self-feeding. The effort of self-feeding often increases muscle tone initially, making oral control less coordinated. More success is likely when the individual has had experience with normal oral-motor sensation.

Feeding therapy is intended to complement and provide carryover from regularly scheduled physical therapy and occupational therapy. A treatment plan should be based on input from every person who feeds the child, especially parents, and then carried out fairly consistently, with attention to changes in the child's skills which will indicate need for program change. A positive approach is advocated in which the child is praised for his/her accomplishments (often enough to make him/her feel good and to recognize his/her efforts, not so much that it loses its meaning). Breaking tasks down into small steps makes it possible to measure changes more readily in severely handicapped children. The Eating Assessment Tool is designed to measure change while looking for normal developmental skills. Abnormal patterns can be described in the comments section, but are not considered in the score.

Eating Assessment Tool (E.A.T.)

Revised 4-77, Pilot Project
Paula Schmidt, OTR

Rating scale based on direct observation.
Bracket ( ) scores when adaptation or assistance used;
score without assistance outside brackets.

1 = 0-10% seldom
2 = 10-50% occasionally
3 = 50-90% frequently
4 = 90-100% almost always
N.O. = not observed

Name
B.D.
Age
Diag.
Ther.

I. Gross Motor Skills, Posture During Feeding

1. Sits on standard chair of appropriate size
2. Symmetrical sitting posture
3. Upright trunk
4. Upright head
5. Stays in chair without slipping
6. Feet supported

Comment, description:

II. Oral Skills

7. Absence of drooling when not eating
8. Mouth closed when not eating, talking
9. Brings head forward to food held in front of mouth
10. Opens jaw only as much as necessary
11. Keeps tongue in mouth when food inserted
12. Tolerates tactile stimulation outside mouth without indication of discomfort
13. Tolerates tactile stimulation inside mouth without indication of discomfort (note condition of gums and teeth).
14. Takes food into mouth from spoon
15. Cleans spoon with lips;
    a. upper lip
    b. both
16. Lips closed while chewing
17. Lips closed while swallowing
18. Food stays in mouth
19. Drinks from cup without tongue thrust
20. Can drink from straw
21. Liquid stays in mouth
22. Bites off food without increasing muscle tone other parts of body
23. Moves jaws up and down in chewing pattern
24. Chews without tongue thrust
25. Lateralizes tongue to keep food between teeth while chewing
26. Takes liquids without resistance
27. Swallows liquids without choking
28. Swallows solids without choking
29. Cleans food off lips with lips and tongue
30. Takes food from spoon without biting spoon

Comments, description:

III. Eye-Hand Coordination

31. Brings hand to mouth spontaneously
32. Able to suck on fingers
33. Picks up object from hard surface (provide four opportunities)
34. Maintains grasp of object
35. Volitional release of grasp (not throwing) based on four requests to put something on table surface
36. Brings objects to mouth (four opportunities)
37. Holds food while sucking, chewing on it (i.e., teething biscuit——stage before purposeful self-feeding)
38. Attempts to assist when being fed (reaches for food, spoon)
39. Self-feeds finger food
40. Places appropriate amount of food in mouth
41. Picks up spoon, holds in functional position
42. Brings spoon with food to mouth
43. Scoops food onto spoon
44. Complete self spoon feeding

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45. Self spoon feeding, neat
46. Holds bottle or cup while drinking
47. Independent cup drinking, seldom spills

Comments, description:

IV. **Feeding Behavior**
48. Interest in eating
49. Cooperation in eating
50. Attends to task, not easily distracted
51. Consumes variety of food, most foods acceptable
52. Appropriate social behavior
53. Normal muscle tone with approach of food
    a. without distractors, other people
    b. with other people, some distractors

Comments, description:

V. **Other (to be answered)**
1. Evaluator perceives needs for intervention
2. Parents involved in changing child's feeding skills (or whomever child lives with)
3. Teacher involved in changing child's feeding skills
4. Regularly scheduled mealtimes
5. Weight recorded periodically. How often?
6. Height recorded periodically. How often?
7. Was behavior at this meal typical? If not, note discrepancies
8. Length of time to finish this meal
9. Describe food (pureed, ground, chopped, bite-size, whole)
10. Food allergies
11. Food dislikes (color, temperature, texture)
12. Medication or food supplements taken at mealtime
13. Foods difficult to eat
14. Usual mealtime procedure (i.e., liquids last or interspersed, how much independence expected; information that would be helpful to new feeding assistant)

Comments, description:

E.A.T. Instructions

The individual items on this assessment tool are worded in a positive way, so that a high score is the ultimate goal. A low score should be interpreted as a possible indicator of the necessity of providing remedial therapy, though the score of a very young child would have to be considered in view of appropriate expectations. If you are not sure how to score an item, consider whether you feel intervention is necessary for that item (e.g., item 10, jaw opening slightly more than necessary is not a problem worthy of intervention, but extreme variance from normal would be). Item 36, toy to mouth, would be scored N.O. if not observed and developmentally inappropriate.

Read over the items before the feeding session. Try to fill out the form during the feeding time or immediately after. Score the items as if you are seeing the client for the first time (comments may be inserted for your records). Bracket scores ( ) when adaptations or assistance is necessary so that subsequent evaluations would reflect changes in the level of independence, preferably including scores outside brackets, indicating function without adaptation or assistance. Describe necessary assistance and equipment as desired for client's record.

You will need the following items during the assessment:
1. A standard spoon
2. A plastic straw
3. A cookie or cracker if client is on a soft diet
4. A cup and liquid
5. A rubber toy to chew if developmentally appropriate. (Present before food.)

This evaluation tool is in the process of being analyzed for revisions. Comments and suggestions may be sent to Paula Schmidt, OTR, Child Development and Mental Retardation Center, University of Washington, WJ-10, Seattle, Washington, 98105.

Analysis of Food Manageability;
Comments on Nutrition

It is often helpful for the therapist to practice eating different kinds of food while imitating the specific problems experienced by the child. As new foods are introduced, carefully observe the child's response (use of oral patterns).

A. **Liquids** are easier to handle when cold or warmed and when thickened (more sensory feedback). Examples: buttermilk, eggnog, thinned yogurt, apricot nectar, milkshakes. Cornstarch, tapioca or unflavored geletin can be used as a thickener.

B. **Solids**

1. Beginning finger foods should dissolve in the mouth after two or three chews. A crunchy quality gives good sensory stimulation. Examples: Breadsticks, soda crackers, dry cereal, toast strips, cheese sticks, Vienna sausage.
2. More advanced finger foods require more chewing. Example: sandwiches, raisins, hot dogs.
3. Chewable foods which break apart into firm, diffuse pieces are more difficult than foods which maintain a more solid single mass. Thus hamburger may be more difficult than chicken or roast beef which mat together when chewed.
4. Most difficult foods are those that don't dissolve when chewed and which require extensive chewing, such as popcorn, nuts, raw vegetables, and meat (especially steak).

C. **Multi-textures** that involve handling a solid and a liquid can be difficult for a child with a lack of coordination of oral musculature. Examples: watermelon, vegetable soup, grapes (skin needs to be chewed while liquid is either retained or swallowed).

D. **Food Preparation**

1. Taste and temperature stimulate chewing and swallowing. Children often like spaghetti, possibly because it is flavorful and colorful. Check temperature on your wrist to see if it is too hot.
2. Gradation of difficulty: liquid —— strained —— mashed —— chopped —— bite-size —— regular table foods —— foods requiring extensive chewing. Start the meal, when motivation and energy level is greatest with more advanced expectations (i.e., foods to be chewed before soft foods).

E. **Nutrition**

1. Neurologically impaired children tend to be smaller in height and weight than "normal" children of the same age. Records of height and weight should be maintained in order to identify discrepancies in percentile which would indicate whether child is over or under weight.**
2. Children with limited energy output may have a tendency to become obese. This would further inhibit movement and energy output. Children with spasticity, athetosis or hyperactive behavior tend to have higher than normal caloric needs due to greater energy expenditure.**
3. Whole milk and whole milk products can be allergenic and/or mucous-thickening. Substitute with powdered milk, skim milk, and skim milk products (cottage cheese, yogurt).*
4. Many children with cerebral palsy have inadequate iron intake. Foods with iron include cooked cream of wheat, dried fruits such as apricots, prunes, peaches, raisins.*
5. Many lunch meats and hot dogs are good for initial stages of chewing, but avoid frequent use due to high levels of chemical preservatives.*
6. If a child must eat strained foods, suggest use of a food grinder or blender in order to use the same foods given to the rest of the family. This practice will be more economical for the family and healthful for the child. When commercial baby foods are used, select the straight meats and straight vegetables and mix them yourself so that the meat content is higher than in the pre-mixed bottles.*

7. If the child needs to have soft foods thickened, untoasted wheat germ is more nutritious than potato flakes or baby cereals. A young infant may not be digestively mature enough for wheat, so rice cereal or powdered milk could be used.*
8. Sweet foods and drinks tend to create saliva and reduce appetite for more nutritious foods.*
9. Children who are on anti-convulsant medication tend to poorly metabolize vitamin D and therefore need extra amounts. Ask your physician or nutritionist for advice.**

In Summary

The feeding therapist should set a good example for the child and his/her parents by the foods suggested and used in the feeding program.

** Suggestions from Suzanne Evans Morris, Ph.D., Speech Pathologist.*
*** Suggestions from Peggy Pipes, M.S., Nutritionist. (See references)*

References

Barnard, K., & Powell, M. Teaching the child with developmental problems: A family care approach. St. Louis: C. V. Mosby, 1976.

Bosma, J. F., (Ed.) Fourth symposium on oral sensation and perception. Fogarty International Proceedings. (Very technical.)

Bowman, M., Calkin, A., & Grant, P. Eating with a spoon, how to teach your handicapped child. NCEMMH Reprint Series, Publ. 4NL-75.906 Columbus: Ohio State University Press, no date.

Britian, L. A. Developmental stimulation guidelines for special children, birth to three years. Mission, Kansas: Infant Development Center, 1974.

Children's Bureau Publications. Feeding the child with a handicap, author unknown? U. S. Government Printing Office: Washington, D. C., 1967.

Children's Bureau Publications. Feeding mentally retarded children. author unknown, U. S. Government Printing Office: Washington, D. C., 1967.

Erickson, M. Management of developmental changes in children. St. Louis: C. V. Mosby, 1976.

Harvey, M. A., (Ed.) Feeding the handicapped child. Distributed by: Department of Nutrition, CDC, University of Tennessee: Memphis, no date.

Holser-Buehler, P. The Blanchard method of feeding the cerebral palsied. American Journal of Occupational Therapy, 1976, 20, 1.

Holser-Buehler, P. Correction of infantile feeding habits. American Journal of Occupational Therapy. 1973, 26, 6.

Leibowitz, J. M., & Holser, P. Building and maintaining self-feeding skills in a retarded child. American Journal of Occupational Therapy, 1973, 28, 9.

Mann, W., & Sobsey, R. Feeding program for the institutionalized mentally retarded. American Journal of Occupational Therapy. 1975, 29, 8.

Mueller, H. Feeding. Chapter 9 in N. Finnie, Handling the young cerebral palsied child at home. New York: E. P. Dutton, 1975.

Peiper, A. The neurology of food intake, chapter 9, Cerebral function in infancy and children. New York: Consultants Bureau, 1963, (Technical, detailed).

Pipes, P. M. Nutrition in infancy and childhood. St. Louis: C. V. Mosby, 1977, (highly recommended).

Schmidt, P. Feeding assessment and therapy for the neurologically impaired. American Association for the Education of the Severely and Profoundly Handicapped Review, 1976, 1, 8.

Stainback, S., Stainback, W., Healy, H., & Healy, J. Teaching basic eating skills. American Association for the Education of the Severely and Profoundly Handicapped Review, 1976, 1, 7.

I. **Development of undressing and dressing skills.**

A. In teaching dressing to the child with a handicap, we must realize that s/he may not spontaneously learn to undress and dress him or herself as a normal child does. However, the handicapped child should be taught according to the normal progression but at his/her own rate of speed.

B. The normal child does not begin dressing activities until about eighteen months of age. At the time s/he sits unsupported in a chair, s/he purposefully places arms and legs into clothing and has already mastered fine coordinated hand movements. S/he learns to dress him or herself in the following progression:

15 months.....she/he cooperates, will put foot out for shoe, arm for sleeve

18 months.....she/he remove mittens, socks, hat, unzip

she/he begins trying to put on hat, socks and mittens

24 months.....she/he removes his/her shoe, socks, and pants

puts arms into large arms holes

helps with panties

30 months.....she/he takes off all his/her cloths independently

she/he puts on socks, shirt and coat although not always accurately

36 months.....she/he undresses rapidly and skillfully

she/he able to dress except for heavy outer clothing

she/he has difficulty discriminating front and back

48 months.....she/he dresses and undresses with little assistance (especially if his/her clothes are laid out)

she/he can distinguish back from front

she/he can button front buttons

II. **Requisites to Establishment of Dressing Skills**

A. It is sometimes difficult to decide when the child is actually ready for dressing. Usually if a child can sit, has the use of one hand, and has his/her feeding well established, s/he may be ready to be taught undressing. Several areas must be considered first. The answers to the following questions will determine at which level teaching should begin:

1. Cognitive Requisites:
   a. Does s/he imitate?
   b. Does s/he follow simple verbal directions involving action & object word combinations?
   c. Does s/he have any perceptual disabilities?

d. Does s/he associate clothing to appropriate part of the body? (Head into neck opening; arm into sleeve.)

2. Body Balance Requisites:
   a. Does s/he sit in a chair with arms?
   b. Does s/he sit in a straight chair?
   c. Does s/he lean free from back of chair?
   d. Does s/he sit on mat or stool?
   e. Does s/he kneel?
   f. Does s/he stand holding with one hand or by leaning?
3. Range of Motion Requisites:
   a. Does s/he grasp with one or both hands?
   b. Does s/he place one or both hands over top of head?
   c. Does s/he place one or both hands to back of neck?
   d. Does s/he have opposition with one or both hands?

B. Assessment and Programming of Dressing Skills. Learning to undress is the first step for the handicapped child. It is of practical value in the home, too, since more time can be allotted to undressing in the evening as compared to the morning rush. After undressing is mastered, the emphasis is placed on dressing. The last steps to be taught are fastenings, such as buttons, snaps, and laces, for they require a great deal of time and skill.
1. In the following discussions of techniques, *progression* has been outlined from undershirt to socks. This order is easiest for even the most handicapped child. Normal methods of dressing and undressing are not included in this discussion, but they are the ideal when possible.
2. For all the following procedures, place the child in the *position* found to be the best for him/her in the evaluation. Adapted equipment is not necessary; for example, the floor, a sofa, or large easy chair may be used at home providing the child is secure and his/her feet are not left dangling. Use large or stretched out clothing for practice and remove the child's braces if they interfere.
3. Since some of the simple techniques described may be difficult to visualize, the reader is urged to try the techniques, step by step, with appropriate article of clothing.

III. Undressing

A. Undershirt, slip-on sweater, polo shirt, dress
1. Duck head method task analysis
   a. reach to back of neck
   b. grasp clothing (one or both hands)
   c. duck head
   d. pull neck forward
   e. continue feeling over his/her head
   f. lead hand grasps edge of opposite sleeve
   g. pull sleeve off arm
   h. pull sleeve off the lead arm
2. Arms out, shake sleeve off first - method task analysis
   a. lead hand grasps edge of the opposite sleeve
   b. pull sleeve forward over elbow
   c. pull involved arm back through armhole
   d. task analysis is completed using the head method

B. Cardigan, coat, jacket and open shirt
1. Flip over method task analysis
   (particularly good for those unable to place arms behind their back)
   a. lean forward
   b. duck head

c. grasp garment at back of neck with both hands
d. pull garment forward
e. pull garment completely over head

2. Arms in front method task
   a. raise arms
   b. place arms behind his/her back
   c. pull sleeves off involved arm using lead hand
   d. move arm forward
   e. remove lead arm from sleeve

C. Trousers, skirt, underpants
   1. Lying down method
      a. place hands on either side of garment
      b. pull garment down
      c. pull garment over buttocks
      d. roll from one side to the other
      e. arch back
      f. push garment down
      g. wiggle body back and out
      h. kick garment off with feet
   2. Sitting up on chair method
      a. brace feet
      b. hoist body
      c. place hands on either side of garment
      d. push garment down over buttocks
      e. lean forward
      f. pull garment up by cuffs or kick garment off
   3. Sitting up on mat method
      a. push garment forward
      b. wiggle body back
      c. wiggle body out
      d. roll from side to side while pushing his/her garment forward
      e. bend knees close to body
      f. pull garment off by cuffs or hem

D. Shoes-shoelaces may be loosened or unlaced if child is unable to do so for him/herself.
   1. Rub method
      a. dorsiflex ankle
      b. rub back of shoe against mat, footstool or the toe of another shoe
   2. Push-pull method
      a. with one foot resting on opposite knee, pull the toe of shoe upward
      b. pull heel down with other hand

E. Socks
   1. Rub method
      a. place hands on upper ridge of sock
      b. push sock down as far as possible
      c. grasp toe of sock
      d. pull sock off
   2. Hook and pull method
      a. hook thumb or fingers at back of sock directly above heel

b. pull straight down
c. pull sock over heel
d. grasp toe of sock
e. pull sock off

IV. **Dressing**

A. Undershirt, slip-on-sweater, polo shirt or dress

1. Duck-the-head method
   a. grasp back bottom of garment
   b. duck head forward
   c. pull garment over head
   d. lead hand holds bottom wide while the involved hand pushes through armhole
   e. repeat for lead arm
2. Arms in first method
   a. lay garment flat on his/her lap or on table with the front side down
   b. open back bottom of garment with his/her lead hand
   c. push his/her involved arm into the sleeve
   d. push sleeve up past elbow of involved arm with lead hand
   e. repeat for lead arm
   f. grasp back of garment firmly with lead hand
   g. pull garment over head
   h. pull garment down all around

B. Cardigan, coat, jacket and open shirt

1. Flip over method
   a. lay garment flat on his/her lap or on a table with the collar near his/her body and the lining showing
   b. push both arms into the sleeves
   c. duck head forward
   d. raise extended arms over head
   e. shrug shoulders
   f. pull garment down
2. Pull from front method
   a. grasp sleeve with lead arm
   b. pull sleeve over involved arm
   c. grasp opposite shoulder with lead hand
   d. pull garment over head to other shoulder
   e. hold garment with involved hand
   f. locate armhole with lead hand
   g. push arm into sleeve

C. Trousers, skirt, underpants

1. Lying down method
   a. pick up garment with both hands
   b. lie down on floor
   c. place one foot at leg opening
   d. push foot in
   e. place second foot in second leghole
   f. roll from side to side while pulling up garment
2. Sitting down method
   a. sit on chair
   b. pick up garment
   c. hold garment open
   d. place both feet in garment
   e. pull garment up past knees
   f. hoist body with one arm or brace his/her feet
   g. pull garment past buttocks with one or both hands

3. Standing method
    a. start as in sitting on chair
    b. raise hand to touch furniture
    c. hold on to furniture with one hand
    d. pull garment up with other hand

D. Socks
1. Scuff slipper method
    a. grasp both sides of sock folded back at the heel so that the sock looks life a scuff slipper
    b. guide toes into sock
    c. pull sock over foot
    d. grasp cuff of sock
    e. pull it up over his/her heel
    f. continue to pull it up the leg

E. Shoes
1. Box method (shoe is placed in box in front of the child or against furniture or wall)
    a. place toes in shoe
    b. plantar flex foot
    c. push foot forward and down
2. Shoe horn method
    a. pick up shoe horn
    b. insert shoe horn in back of his/her shoe
    c. put his/her toes in shoe
    d. push down and forward with his/her foot
    e. remove shoe horn
3. Pull method
    a. rest one foot on opposite knee
    b. pick up shoe
    c. place one hand on heel
    d. place other hand on tongue
    e. hold shoe open in front
    f. plantar flex foot
    g. push toes in shoe while other hand pushes up on shoe bottom

Handout 4

Prelanguage Development Chart

Chronological Age	Motor Behavior	Vocal Behavior	Situation Response
.5 mo.	Imitation of facial expression Child Strategies a) imitate b) stop motor actions and show distress	Moore and Meltzoff (1975) Distinguishable hunger cry ← - - - - - - - - - - - - - - - - - -	If Mother responds with non-matching gesture
1-3 mo.	Infant approaches a dangling object Child fixates on a doll having a face longer (for a longer time) than fixating on doll without face Bates (1976)	Responds differentially to friendly vs. hostile voices Lieberman (1967) Differentiation between exaggerated (baby talk) and normal intonation Lieberman (1967) Differentiation between inflection and noninflection Kagan & Lewis (1965) Contrary to principles of operant conditioning - reinforcement of crying behavior does not produce more crying behavior Bell & Ainsworth (1971) Vocalization-vocalization pairing is the most common parent-child interaction.	Holding infant when cries are instituted

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Chronological Age	Motor Behavior	Verbal Behavior	Situation Response
	Smiling and looking are instrumental in eliciting and/or reinforcing a member's vocalization. Lewis and Freedle (1971) Smiling to facial stimulus increases rapidly peaking at approximately 13 weeks. (Ambrose, 1961, Watson, 1966) Smiling Function release of emotional energy recognition Hunt and Uzgiris, 1964 3 mo. old girls vocalize more to male than to female faces (Zelazo, 1967, 1969)	Female infants detect difference between mother's speech when child is object of speech vs. where someone else is the object of mother's speech. Lewis and Freedle (1971) Female infants vocalize more when mother vocalizes to them than when she vocalizes to another. Lewis & Freedle (1971)	Physical space, such as room is not clear indicator of context. Most of infant's time is spent in: 1) infant seat 5) sofa 2) play pen 6) floor 3) mother's lap 7) bath tub 4) crib or bed 8) jumper swing Mother's lap is most common situation Jumper, floor and play pen are least frequent Lewis & Freedle (1971) Most vocalization in play pen Lewis & Freedle (1971)
4 mo. **Indicating**	Infant follows adult line of regard when adult turns toward locus away from child Bruner (1975)		Adult models activity while child glances or tempts child with object to establish eye contact Bruner (1975) Mother's line of regard follows infant's Kaye (1976)
Demand	Means of expressing discomfort pain and/or physical discomfort hunger demand for social interaction fatigue and/or frustration Some phase of action is marked (reach toward an object with fretting vocalization).	Cries - could be idiosyncratic or universally phonological Demand cries - insistant with no pauses in anticipation of response	

Chronological Age	Motor Behavior	Verbal Behavior	Situation Response
	People are touched, batted at, mouthed like inanimate objects. They are also however clung to, rubbed against & held close.	Child never approaches adult to invoke help to obtain objects.	
4-9 mo.	Child turns head in same direction adult turns his/hers. Bruner (1975)	Pitch changes marking manipulating objects vs. interaction with mother Bruner (1975)	
Discovery			
Request	Child holds hand out toward object in non-grasping directional gesture Bruner (1975)	Sharper onset voicing when reaching toward out-of-reach objects Bruner (1975) see Lyons (1974)	If a request fails, the infant will resort to demands. Bruner (1975)
	Visual cross checking-Infant initiates motor response but occasionally glances at adult. (Sugarman 1973; Bates, 1976)	1) greater variation in frequency of utterance than in a demand 2) vocalization pauses in anticipation of a response Bruner (1975)	Important role in this activity for a consistent caretaker in shaping request mode Ainsworth (1975)
	Intentional imperatives & declaratives at 10 months Bates (1976)	child calls for object → receives object hands object back ←	
8-10 mo.	uses adults to obtain objects uses objects as a means of adult attention		
Exchange	shows off, repeats behaviors that have previously been successful in provoking response extends arm to show object		Scaffolding - mother may be seen to hold box for child to put toys in. (Wood, Ross and Bruner, in press)
Reciprocal	Interactions organized around task-reciprocal but non-identical roles Bruner (1975) interchangeable turns Garvey (1974)		

Chronological Age	Motor Behavior	Verbal Behavior	Contextual Variables
10 mo.		Dore identifies four substages in speech act development 1) the prelinguistic stage - cognitive schemas and oractic attitudes signify communicative intent and prompt "rudimentary linguistic messages." 2) presyntactic stage - single word forms and prosodic features 3) syntactic 4) complete speech acts - Dore does not attempt to delineate what fully elaborated acts or strategies would be	1) location: distance from infant to mother 2) physical contact (kiss, hold etc.) 3) prohibitions (interfering with) Tulkin & Kagan (1970)
		The following speech acts occur during the one word stage: labeling, repeating (words or prosodic patterns), answering (the adult's utterance just prior to his/hers), requesting, calling, greeting, protesting, practicing (verbal play). Children vary in the extent to which they use words or prosodic features to express these speech acts. The child who uses words does so primarily to accomplish something - manipulation. Those using prosodic features primarily, use words to label, repeat or declare things about the environment. Thus children can be labeled as either declarative or manipulative in their early speech act strategies. From Folger (1975)	Videotaped mother-child play sessions for 30 to 45 minutes every other week for six months. Dore (1973)

Chronological Age	Motor Behavior	Verbal Behavior	Situation Response
12-13 mo.		Three classes of verbal behavior vocal behavior in which no referent is evident labels used in presence of particular objects or events not modified but adopted by parents as is Bruner (1975) verbal behavior in which there is a loose referent available. Bruner (1975)	
		Development of categories of objects are built on a common basis of sharing "motor programs" and of those perceptual features required for their execution. Rosch (1974)	**Comprehension Strategy** 12-18 mo. Do what you usually do in the situation.
13 mo.	Child shows then gives object. Pointing & gestures are first used communicatively. orients toward interesting event or object-point, at object - swings around and points at adult. pointing for self pointing for others Werner and Kaplan Uses object to operate on human for attention	Decontextualization (indicating strategies not so closely linked to specific action patterns in which they are embedded) (more pre emptory reach rather than exaggerated reach) Depends on distance of object from hand	

Chronological Age	Motor Behavior	Verbal Behavior	Situation Response
13-14 mo.		Communicative Functions Observed By Dore Repeating — Greeting Labeling — Protest Answering — Practice Calling — (vocal play)	
	← Usually accompanied by motor action (often noises object makes) quack for duck, etc.	All child's utterances are performatives (direct expression of what one is doing in the utterance). Gruber (1967)	Descriptive study of Dory's spontaneous utterances Gruber (1967)
		Child also interprets most adult utterances as performatives Gruber (1967)	(18-24 mo) **Comprehension Strategy**
14 mo.		Reportatives emerge (attributes of the theme remote from the speech act) Gruber (1967)	Locate objects mentioned and give evidence of notice or do what you usually do Chapman (1976)
18-24 mo.	Child's repertoire abundant with avoiding, resisting, showing, requesting and initiating reciprocal play Escalona (1973)	Child's responses to utterances functioning as request and demand included 1) appropriate 2) literal 3) negative 4) indeterminate 5) request clarification 6) ignore 7) look	Observation of mother-child interactions observed in the home Escalona's observations The majority of child responses were distributed bimodally between appropriate and ignore
	100% of imperatives uttered to child are motor-cued. 87% of question directives are motor-cued. Shatz (1975)		

Chronological Age	Motor Behavior	Verbal Behavior	Situation Response
19-25 mo.	Repetitions do not influence the likelihood of a response Shatz (1975)	Communicative acts of parents imitated by children Elicited imitation repetitions ——— prompts to imitate Descriptions request for infor. ——— prompts to talk Statements requests for action ——— prompts to act imitations are most frequent speech act used by parents in addressing children. Next frequent in order 1) requests for information 2) descriptions 3) requests for action 4) statements 5) elicited imitation	
Prior to 2 yr. 9 mo.		Folger & Chapman (1976) need statements - I'm hungry identification of goal objects or locations - more juice imperatives - push me	utterances to peers
3 yr.		Ervin-Tripp (1974) Commands instigated by word "please" are interpreted as commands Commands are discriminated as such on the basis of intonation Interrogative requests are not judged as polite by three year olds. Bate (1974)	-children requested candy from a doll and then were told to ask "even nicer" -pairs of requests were then heard and the children had to choose which was nicest.

Chronological Age	Motor Behavior	Verbal Behavior	Comprehension Strategy
2 yr. 4 mo.		only issues questions to 4 yr. olds same child uses almost entirely simple imperatives with peers shows differential performance with 3-4 yr. olds mean length of response shorter to baby and baby doll than older individuals more repetitions to baby more attention getting devices to baby and baby doll Sachs and Devin (1973) children differentiate between more and less polite forms	2-4 yr. Do what is usually done probable location strategy probable event strategy Chapman (1976)
2 yr. 6 mo.			

Adult Command Forms

1) interrogative→got a match
2) imperative→give me a match
3) embedded imperative→ could you give me a match
4) statement of desire→ I need a match
5) statement of external condition→ There aren't any matches here

Respond to indirect modes of eliciting information
Do you know where the sugar is?

Statements of need are appropriately responded to by child if the situation is obvious.
If the circumstance is not obvious, child will not act appropriately

Services not given when interrogative requests are used (unless object has a normal state or location which the child reinstates)

Variables Controlling Request Alterations Between Interrogative Requests and Imperatives

1) territorial location of speaker and addressee
2) familiarity: similarity of rank & age
3) relation of the directive to expected roles
4) seriousness of the service requested whether compliance may be assumed

→ In this form all words are present to inform child about ideational content of sentence.

→ Child will give cookie if one says "I'm hungry" while looking at cookie.

May relate to comprehension strategy.

Chronological Age	Motor Behavior	Verbal Behavior	Situation
2 yr. 9 mo. - 5 yr. 3 mo.		When the speaker was a child, 33-49 months old listeners did not discriminate among familiar forms and 52-63 mo. listeners could discriminate between the familiar animate but not the novel forms.	
		Pragmatic Strategies **Direct** reliance on grammar to express literal intention of utterance (I'm working.) **Indirect** utterance occurring in a context which normally may have a different communicative intention associated **Metaphysical** literal semantic meaning is impossible (You can't catch me.) **Tagging** grammatical tag alters meaning of utterance (You do this, OK?) Dore (1975)	Videotaped children in a pre-school setting one hour per month for four months. 1) semantic meaning 2) grammatical and prosodic operators (word order) 3) introduction of new information 4) contingent relatedness to previous utterances 5) verbal and nonverbal response of listeners 6) contextual features In Folger (1975)
Of the 565 well formed direct requests for action, 53% achieved their intended perlocutionary effect (accomplished what was wanted or showed understanding of request) Of the 82 indirect requests, 75% achieved their intended perlocutionary effect. Conversational sequences can be established for request formation. The components of the request for action speech act seem to occur in the following order: a) preparation; b) adjunct; c) request proper; d) repetition of the request; e) acknowledgement Conclusion: In preschool children, the discorsal rules governing requests are quite complex and the ability to interpret indirect requests is already present. Garvey (1974) In Folger (1975)		Dyads use fewer indirect requests than older dyads. Garvey (1974) Non-compliant responses are often followed by repeats or pleads (Please, come on) Speaker may try to make sure that referring terms of the proposition are available to the listener (See that hammer there?)	Examined the request for action speech act in a nursery, free play setting. Garvey (1974) Basis of listener behavior depends on 1) willingness 2) ability 3) reason s/he should comply 4) obligation 5) memory (Don't you forget)

Chronological Age	Motor Behavior	Verbal Behavior	Situation
4.3		A learning effect over three trials observed as well as significant difference favoring animals over symbols.	
3.5 - 4.6		Children draw adults into conversation by using three strategies: 1) exploratory interjections 2) interrogative interjections 3) multiple statements including explicit questions Children obey rules that one child speak at a time Questions are answered before new topics are introduced **Strategies to engage others in talk** 1) statements calling attention to personal attributes or possessions 2) statements and requests used in conjunction with an interrogative interaction 3) exclamatory interjection Phillip Butt Metzger (1974)	
7 yr.		87% utterance unrelated to previous comments 8% new topics 4% logical continuation Baker (1942)	

Chronological Age	Motor Behavior	Verbal Behavior	Situation
		No direct requests emitted with performing verbs. Garvey (1974)	**Comprehension Strategy** 4-11 yr. 1. Word order strategy 2. Order of mention strategy 3. Probable relation strategy Chapman (1976)
		Conditional and formal address not distinguished until 6. Bates (1974)	
		child will reformulate initial message when explicitly requested to do so by listener (You'll have to tell me more.) child will not reformulate message when given a gestural shrug (As if I don't get it) Flavell, Danner and Peterson (1972)	Children were given three types of indications of communicative failures - nonverbal, implicit request for help. and explicit request for help. From Folger (1975)
		MLU to adult greater than MLU to 2 yr. old differential use of relative clause, subordinate constructions and coordinate constructions, to adult as opposed to 2 yr. old no differences were found in the language addressed to peers vs. that addressed to adults. Shatz & Gelman (1973)	Children were asked to explain the workings of two toys to both the adult experimenter and a 2 yr. old child, as well as a peer. From Folger (1975)

Chronological Age	Motor Behavior	Verbal Behavior	Situation
		An analysis of the type and frequency of the different persuasive appeals indicated that the major differences were due to age of the target and not the birth order of the subjects. Bragg, Ostrowski & Finley (1973)	First and last born children attempted to persuade older, same aged and younger target listeners to eat crackers.
		Children modified their directives as a function of their listener's age status. In command situations, children were most polite to an adult listener, next most polite to peers and least polite to younger listeners. In request situations only a difference in politeness between directives addressed to adults and younger children was found. Children used more interrogatives as polite forms to adults (Would you give me my ball?) and thus seem to follow the "give options" rule of politeness in conversations - There was a higher percentage of *please* in the directives addressed to adults in the command situations than in the request situations. The imperatives to adults are thereby tempered by the use of this polite form.	Directive utterances were elicited from children in 8 role-playing situations. Four situations elicited commands and four requests.
		Children at this age were not able to come back (at least the elicitation task) with alternative or repeated request strategies once denied. Out of the 28 requests in permission situations, only six instances of coming back after an initial denial were found. "Please" was the only request descriptor which occurred consistently across responses. "Please" was used in 45% of all Requests for Permission and Requests for Objects uttered. Resort to physical action (I'd take it away) was the second most consistent strategy although it fell far below the use of "please".	Three elicitation tasks were used to assess the magnitude and content of the child's repertoire of a) request for permission; b) request for information; c) request for an object.

Chronological Age	Motor Behavior	Verbal Behavior	Situation
		Egocentric speech was found to be common in the 4-6 age group but declined thereafter and is practically absent in older children capable of internalized logical thought. Intelligence did seem to be a significant determinant of the incidence of private speech because it presumably reflects the child's level of cognitive development. The findings are seen as consistent with Vygotsky's view of inner speech as a transitional stage toward inner thought rather than a Piagetian view of egocentric precommunicative orientation to social situations.	Sampled speech of children of various IQ and social class levels and scored it for egocentricity. Kohlberg, Yaeger Hjertholm (1968) In Folger (1975)

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Communication Behavior for the Severely and Profoundly Mentally Retarded Child: Assessment and Early Stimulation Strategies

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Two recent surveys of teachers and childcare workers working with severely and profoundly mentally retarded (S/PMR) children indicated that communication skills was the area in which curriculum information was most desperately needed (Lynch, Shoemaker & White, 1976; Maurer, Weyman & Reichle, 1977). It is precisely this issue on which this handout will focus its attention. The rationale for our program discussion draws from the motor, social and communicative behaviors exhibited by normal developing children. Our discussion is accompanied by the notion that although *normative data serves to guide teachers and clinicians in curriculum development, it may not necessarily lead to success in terms of teaching procedures* (Miller, 1977).

Where We've Been

Our earliest attempts at communicative intervention, with children who had not yet acquired language at a normal rate and age seemed to be an attempt to answer Roger Brown's (1958) question: "How shall a thing be called?" The assumption of early interventionists was that expressively the child should be taught individual labels for a variety of objects. Subsequent intervention included attempts to teach words describing actions that could be applied to the objects. Eventually object names and action names were chained together and the child was declared a multiword user. Subsequent intervention, stressed the establishment of a variety of noun phrase and verb phrase descriptors (adjectives, adverbs, prepositions, pronouns) in the child's repertoire. Finally, these newly acquired descriptors were cycled through the chaining paradigm.

Our initial attempts at the establishment of receptive communicative skills in SPMR children appears to have been little more than an attempt to teach visual-auditory discrimination and compliance. The receptive language program characteristically consisted of a regimen to establish object identification, and a second program to teach instruction following. After a series of successively reinforced approximations, the child learned to point to the appropriate referent (given 2-3 other foils) upon hearing its name. The instruction following program operated in a similar fashion. Instead of using a pointing response, however, the response topography shifted to the child's performance of a variety of actions (sit, come, stand, etc.).

Unfortunately, many children subjected to the rigors of the early interventionist failed to acquire communicative skills that could be used with a variety of people, at a variety of times and in a variety of situations. Early expressive language programs frequently ignored the functions that communication could serve (e.g., demand, request, indicate, etc.) and stressed only the phonologic and syntactic form of the utterance which has little phychological reality for the child. Similarly, in early receptive programming, the vocabulary chosen to teach was selected primarily on the basis of what words were easy to picture, and seemed appropriate to teacher and clinician. Too frequently these were based on a priori notions of what we believed a child should know. The vigorous efforts of researchers (Bruner, 1975; Bates, 1976; Dore, 1975) to investigate and discover the importance of communicative function to the understanding of early child language, has added exciting potential to the building of a more appropriate and effective communication curriculum for the communicatively handicapped. The recent evidence (Clark, 1974) discussing the importance of perceptual and functional saliency of objects has greatly assisted interventionists in stimulus selection in the area of object identification. Likewise the efforts of Bloom's (1973), Greenfield and Smith's (1976) and

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Chapman's (1977) descriptions of the importance of context and cues that upon early verbal instruction following, have strengthened our ability to assess, stimulate and intervene in the child's early comprehension skills.

In spite of our ever increasing sophistication in assessment and intervention, there are a significant number of children who do not acquire a functional communication system. Children who fail to learn even the most rudimentary receptive and expressive communication skills often find themselves relegated into the ranks of a pre-communication program. Pre-communication programs usually involve the establishment of some sequence of eye contact (attending) motor and vocal imitation. Recent reports (Guess, Baer & Sailor, 1977) suggest that our efforts to establish pre-communicative skills may be no more successful than our early attempts to establish communicative skills (i.e., only 30 to 40 percent of the S/PMR children entering Guess, Baer and Sailor's vocal imitation program successfully completed it). This has been more a function of what we have believed to be necessary behavior for communication to be learned (e.g., attending and imitating) rather than what actually needed to be known. More recently with our better understanding of the function of communication behavior, we note the possibility that we have been placing emphasis on non-criterion related topographical behaviors rather than attending to those behaviors which affect cognition on a more basic level.

Bates (1976) has suggested that prior to the development of interpersonal communicative behavior a child must 1) become aware that others around him/her are using a system of communication, 2) discover roles of pre-communicative give and take, 3) discover shared symbols that may be used to indicate and demand, 4) discover shared symbols indicative of individual referents and 5) learn the meanings for these symbols in isolation and later in combinatory strings. In spite of the fact that there have been no demonstrations reported that intellectually delayed children follow the normal child's developmental sequence as described by Bates, we conclude that normal development provides the best point of departure for curriculum construction.

The next section of this handout will describe the topography of early developing communicative and communicative-like behaviors which we believe are important in the construction of assessment and intervention tasks for severe and profoundly handicapped children.

Early Communicative Behavior

A. Awareness of communicative partner

The child's early awareness of the presence of a communicative partner has been described by numerous investigators (Moore and Metzoff, 1975; Bruner, 1975; Kaye and Brazelton, 1971; Jaffe, 1973; Lieberman, 1967; Lewis and Freedle, 1973; Carpenter, 1970; Kaye, 1975; Condon and Sander, 1974; Browne, 1975). Moore and Metzoff (1975) demonstrated that infants as young as several weeks of age exhibit rudimentary forms of motor imitation of an adult model. Stern (1974) observed that infants avert their gaze away from mother when stimulation becomes too intense. Brazelton (1971) has described patterns of cyclical attention and gaze aversion between infants and their caretakers. These cycles were observed in analyses of gross movements, facial expressions, changes in facial expression and mutual gaze patterns that occur between mother and child. Carpenter (1970) demonstrated that children become more vehement in their efforts to elicit attention before resorting to strategies of crying or withdrawing from the interaction. Carpenter's (1970) investigation is particularly important because it demonstrated the ability of the child to 1) exhibit awareness of a communicative partner and 2) exhibit a form of initiated intentional preverbal communication (Hey, I need attention).

The recently developed observational sophistication reported by Sagi and Hoffman (1976), Brazelton, et al. (1975), Browne (1975), Lieberman (1977) clearly demonstrate the relationship between early social-auditory behaviors and the development of early communicative skills. Behaviors including 1) response to familiar vs. stranger, 2) differentiation between facial expressions emitted by another, 3) emission of early line of regard, clearly play an influence in the mother's behavior emitted in the presence of a child. A prime example of the latter was reported by Kaye (1975) in which six (6) month old children obtained assistance from their mothers by turning their heads from the problem at hand to their mothers. Similarly, Bruner and Sherwood (1974) have made the observation that children perform quite differently depending upon whether the other member of the dyad is a familiar or unfamiliar individual. The point we wish to make is that, *it is not enough to simply observe the*

topography and sequence of isolated communicative behavior. Of equal importance is the social context in which the communicative behaviors are emitted. To date, there has been a general lack of attention to the analysis of interactive communicative development as related to the social context in which communication occurred. This is particularly true of the young child functioning between the ages of four (4) and twenty-four (24) months of age (Lamb, 1976). The failure to examine the social component in assessment paradigms, is to ignore an important concomitant of earliest communicative behavior.

B. Early communicative give-and-take

Carpenter's (1970) observation of initiated communicative strategies in young children is crucial to a description of early communication development. In order to be communicatively successful, the individual must be able to assume the role of both speaker and listener within the course of a single period of communicative exchange. Stern and Vietze (1975) and Vietze, et al. (1975) have demonstrated that mothers are more likely to begin talking when infants are already exhibiting vocalization behavior. Piaget (1952) observed that children also exhibit a greater propensity to vocalize when another individual in the proximity of the child is already vocalizing. Piaget refers to this behavior as vocal contagion (which occurs between 2-4 months of age in the normal infant). The preceding sequences could be likened to a relationship of contiguity rather than contingency.

Slightly later (approximately three (3) to five (5) months of age) the child exhibits vocal turntaking behavior such that if s/he vocalizes and the adult imitates his/her vocalization, s/he will imitate the adult (or reproduce his/her original vocalization (Child-Adult-Child). This sequence is generally viewed as a behavior preceding the omission of *traditional* vocal imitation behavior.

During the same time frame that vocal, but noncommunicative turntaking between adult and child is being exhibited, motor turntaking behaviors are also evident. Kaye (1975) observed that mutual attending (eye contact) and head aversion are used in the exhibition of turntaking games such as peek-a-boo. Bruner and Sherwood (1974) have corroborated Kayes observation observing that peek-a-boo routines are actively engaged in by one (1) year olds.

C. Establishment of individual functions of symbols

The development of both motor and vocal behavior is of critical importance in the exhibition of early intentful communicative behavior. Leopold (1907) and Guillaume (1927) described sequences in which motor and vocal behavior were combined and used to *demand* and *indicate*. More recently Bates (1976) and Greenfield and Smith (1976) have corroborated the early reports. Bates has named these two early functions of communication protoimperative and protodeclarative respectfully. Protoimperatives involve the use of an adult to obtain a desired object. Alternatively, protodeclaratives involve the use of an object or self to attract another's attention. Thus the importance of early gaze behavior as well as the importance of early initiated motor and vocal turntake on the part of the child becomes evident. In addition to mutual attention, the normal child exhibits a developmentally related sequence of motor behaviors in the exhibition of protoimperatives. According to Bates (1976) these behaviors include: 1) prehension; 2) turn of body or reach; 3) indirect indeterminate display of means-ends (pulling an attached string to obtain a toy that would otherwise be out of reach). Motor components of protodeclaratives include the developmentally progressive ability to: 1) arm extention, approach and grasp; 2) showing off; 3) showing; 4) giving; and 5) pointing (these behaviors may also be used in protoimperatives.) Developmental changes reported in the sophistication of the vocal component of early imperatives and early declaratives include 1) the use of individualized prosody (intonational and intensity changes in vocalizations) relative to a variety of environments and 2) improvements in speech intelligibility. Subsequent to the child's acquisition of the communicative functions of global demand and request, differentiation in function occurs. For example, one can demand and request in order to obtain; 1) information, 2) action, performance, clarification, confirmation, etc. (see Dore, 1975). At the same time that the child is developing these differentiated uses of demand/request s/he begins to develop the ability to comprehend and produce individual referents.

D. Establishment of individual meanings of symbols

Wells (1974) has suggested that the child's first encoding of lexical items encompasses entire *situations* rather than an *individual meaning*. That is, a child may encode the word "snake" to describe

a situation in which a snake is moving across a field. The word snake is also used to encode the movement of a worm across a sidewalk. When a dog moves across the sidewalk however, the word snake is never produced. Additionally when a snake lies quietly on the sidewalk the child does not encode the word snake. This example suggests that original use of the word was dependent upon 1) general but not specific animal type and 2) presence of movement. Wells (1974) has contended that the child comes to home in on the specific referent that matches the adult meaning for a given lexical item as opposed to one day not using a lexical item at all and the next day using it with a high degree of lexical specificity. In the normal child's development, consistencies have been obscured in the child's failures to appropriately comprehend and/or use a given lexical item. One type of failure has been referred to as systematic overinclusion (Bloom, 1973). In this error of meaning the child may name a poodle or golden retriever both dog, but s/he may also call a horse a dog. S/he can appropriately identify a class member but s/he may also classify other objects as being in the same class even though they are not. One explanation for failures such as the one above lies in the classification criteria used. Dogs and horses are in many ways perceptually similar (i.e., they both have ears, a tail, four legs, fur, they may be the same color). Unfortunately, they have perceptual attributes that are not in common that may go unnoticed (one barks, one is large, the other is relatively small). Additionally dog and horse can be functionally classified (i.e., horses are to ride, dogs are not to ride). It is generally agreed that through experience, the child gradually comes to acquire reliable classes for the the words which s/he at first may have been able to identify but unreliably discriminate from other objects similar in some noncritical dimensions.

This discussion suggests that initial acquisition of a word under some conditions may not be sufficient to insure even appropriate usage with the same person, at the same time, in the same place. It does suggest that acquisition may be taking place in what others are calling generalization training.

The Influence of Normal Development On What We Assess and What We Teach

Baer (1974) has expressed the belief that:

> *"No matter what the problem presented to the child, if he will not learn it on terminal contingencies, perhaps we should assume that there is always a program which will lead him from where he is now to that skill. (This) assumption leads you to discover teaching techniques rather than to put problems aside and say he must not be developmentally, conceptually or cognitively ready for this skill."*

Baer's statement presumes that 1) a developmental approach is not the most efficient curriculum order and 2) a developmental approach does not permit the intervention in the establishment of cognitive skills and 3) developmental curriculum cannot be integrated with nondevelopmentally based curriculum.

Establishing an Efficient Curriculum

Cromer (1974) has suggested that certain cognitive behaviors emitted during the first two years are necessary but not sufficient to explain the acquisition of communicative behavior. Cromer's views are supported by McLean and Snyder (1977) who have suggested like Bates (1976) that cognitive skills involving demonstrations of causality and means-ends may be crucial in the establishment of early combinatory modes of motor and vocal communicative behavior. The viability of the hypothesis of cognitive requisites to the acquisition of communicative behavior has been demonstrated by Reichle and Yoder (1976) and Kahn (1976). Reichle and Yoder (1976) who observed that no *intentional* communication was emitted by a severely and profoundly retarded population unless Piagetian sensorimotor stage 5 means-ends was demonstrated. Additionally, they observed that within session, communicative forms (pointing, loud vocalizations) could be trained to serve the function of a demand. These communication behaviors, however were not exhibited spontaneously unless the child spontaneously emitted stage 5 means-ends behavior. Kahn (1976) reported from his observations that the severely-profoundly retarded population exhibited no examples of verbal referents unless they were functioning in Piagetian sensorimotor stage 6. This is the stage during which Bates (1976), Dore

(1975) and Greenfield and Smith (1976) have reported the first evidence of referentially appropriate verbal communicative behavior. The basis of the evidence that does exist suggests that emitted cognitive behavior is related to the emission of early communicative skills. Current evidence also suggests that motor behavior often used to display early communicative intent develops in the same sequence for both normal and SPMR children. In one final example, Reichle and Yoder (1976) time sampled SMR/PMR childrens' emission of show, give and point behaviors. The results of the investigation revealed that the emission of SMR/PMR children corresponded to the emission of these behaviors in a normal developing population.

Contrary to Baers' (1974) point of view, it appears that a normal developing sequence is exhibited by SMR/PMR children with respect to early developing communicative behaviors. In the one instance described by Reichle and Yoder the presence of a developmentally earlier skill appeared to affect the teachability of a later developing behavior.

Can a developmental approach be integrated with a nondevelopmental approach?

Miller, Reichle and Branston (1977) in discussing paradigms of early communicative assessment have described weaknesses of pursuing a strictly developmental approach to assessment. We list below those weaknesses and suggest that they apply to the formulation of intervention protocals as well. We refer the reader to the direct source for further elucidation. further elucidation.

Weaknesses of a normal developmental approach

1. There is a sparcity of data describing the frequency with which early communicative behaviors occur.
2. Data obtained is usually based on a small (N) with respect to communicative behaviors described in this handout.
3. Data is obtained in such a variety of environments using slightly different procedures that it is difficult to pool.
4. Variation reported in the normal developmental data that for many behaviors a sequence is difficult to establish.
5. Normal developmental data is not particularly enlightening for the child who does not exhibit the traditional means of communication exhibited by normal children.
6. Normal developmental data does not account for the social mismatch between communicative behaviors exhibited and social needs for communicative use.

The position that we assume in this chapter should by no means be viewed as being at cross purposes with the belief that expressive and receptive skills can be established without following a developmental sequence. Through the use of a paradigm similar to that advocated by Guess, Sailor and Baer (1976) we have been able to establish early indicating and demanding behavior in addition to object labeling. However, we have not demonstrated that these behaviors generalize to a different setting, with different people and to different times. We have been unable to obtain both *initiated* behavior in addition to *responded* use of the skills in these generalizing conditions.

The clinician of communicative disorders in establishing an assessment and intervention curriculum must choose content from both developmental and nondevelopmental approaches as determined by the individual needs of the client.

Assessment of Early Communicative Behavior

Frequency of Communicative Behavior

If our experiences aimed at assessing severely and profoundly retarded children have taught us anything, it would be that one cannot rely upon one method or procedure to obtain the required or desired information about the child's communication behavior. Kaplan (1964) has warned against the use of a testing paradigm simply because it is available. He calls such an activity an engagement on the Law of the Instrument.

> *". . . . . give a small boy a hammer and he will find that everything he encounters needs pounding. . . . . " (pg. 28)*

In the past there have been several unsupported generalizations that have found their way into this rubric of the law of the instrument. It is frequently suggested that SPMR children rarely initiate

social or communicative behavior. Acceptance of this notion results in the conclusion that attempts to spontaneously observe communicative behavior through observation is a high risk event.

A postulate often given as a result of our preceding observation is that elicited assessment procedures provide a realistic picture of the behavior emitted by a SPMR population. This idea is based on the notion that an elicited task uses more salient cueing than the SPMR child typically experiences.

The literature available on the frequency of communicative emission of SPMR children confirms the belief that the intentional communicative behavior (verbal or verbal and motor) is relatively infrequent (Reichle and Yoder, 1976). It is important to place the low frequency of early intentional communicative behavior in the context of what we know about the frequency of early intentional communicative behavior in normal children. Greenfield and Smith (1976) have observed that at approximately one (1) year of age, normal children produce six (6) to seven (7) utterances per hour of observation. The fact that communicative behaviors occur relatively infrequently in normal children has not precluded accurate observational descriptions of early communicative behavior of normal children. Reichle and Yoder (1976) observed that a severely-profoundly retarded residential population functioning in Piaget's late sensorimotor stage 5 (emitting performative imperatives and declaratives) produced fewer communicative behaviors throughout an hour of observation than Greenfield and Smith (1976) reported for their normal children. Reichle and Yoder's data tentatively corroborates Leonard's (1972) speculation that the frequency with which a communicative behavior is emitted may be a crucial variable in the determination of communicative deficiency. Thus it appears that SPMR children infrequently exhibit communicative intent is valid.

The idea that we have yet to address, focuses around the belief that elicited assessment is more reliable than observational assessment. There have been relatively few attempts to evaluate this hypothesis. Weber (1968) examined the ability of individuals to observe a prelinguistic localization in response to the presentation of an auditory stimulus. He observed that when the observers did not know when the stimulus was presented they tended to record responses that were actually spontaneous movements rather than reactions to stimulus presentations. This data suggests that in the observation of precommunicative skills in an elicitation task, a relatively high number of "correct responses" may have been false positives.

In an attempt to weigh the respective pros and cons of elicited and observational assessment, we examined eight (8) SPMR children functioning developmentally somewhat below twelve (12) months of age. We selected three behaviors to assess: motor imitation, auditory localization along a horizontal plane and object permanency (sensorimotor stage 3). All children received a total of five (5) hours of observational assessment as well as a separate twenty (20) trial elicitation tasks for each of the behaviors under consideration. Results suggested that in five (5) of the eight (8) children, the *most frequently observed behaviors were not* the most frequently *elicited behaviors.* When the observational data was viewed in terms of successes per number of observable environmental discriminative stimuli, the agreement between responses to naturalistic vs experimentally administered S^D's ranged from .52 to .67. Viewed in terms of correct responses/total trials, four (4) children emitted higher percentages of appropriate responses during observational assessment. Our interpretation of these data have led us to believe that there is no *single* method that will necessarily result in a valid assessment of early communicative and precommunicative skills in S/PMR children. Miller (1977) has suggested that *"The use of elicited assessment procedures is warranted when specific aspects of language are to be analyzed and their frequency of occurrence in naturalistic settings is limited..."* This rationale is based on the fact that elicitation procedures are generally less time consuming than observational assessment. Our philosophy is that *there is no one single decision rule to be dealt with in the selection of a strategy to be used in the implementation of an assessment protocol.* Instead there is a delicate balance between what strategy is experient and what strategy will emit the most representative information relevant to the child's communicative skills.

Contingency of Communicative Behavior

One characteristic important to the description of communicative frequency is the contingent relationship between the emitted communicative behavior and the antecedent and consequent events operating in the environment. Several investigators, Yoder (1976), Reichle and Yoder (1976), Siegel and Harkness (1963) have observed that SPMR children often fail to initiate communicatively

intentful behavior even though they may frequently respond when given a clear discriminative stimulus for a response. In the SPMR children with whom we work (C.A. 1 year-13 years sensorimotor stage 4-6) we have observed that a very small percentage (6%) of the emitted communicative behaviors are *initiated* communicative behaviors. Viewing contingency relationship within the context of the frequency of emitted communicative behavior they would seem to suggest several points in violation of the notion that an elicited assessment is a more viable procedure for the SPMR child.

It would appear that assessment of early emitted communicative behavior via an elicited protocol may skew a complete observation of antecedent and consequent events. This results from the fact that the antecedent event is predetermined by the examiner. Consequently, the child is always observed while responding rather than initiating. If our observations are correct, a significant amount of communicative behavior which is initiated by the child may be unreliably assessed through the use of only elicited assessment procedures. Our conclusion is that *elicited assessment, in and of itself, will not provide sufficient information in a comprehensive communicative assessment protocol.*

Since we have already established that children's emission of communicative behaviors in a free operating environment is relatively infrequent, the use of an observational assessment paradigm may be time consuming.

A third assessment strategy available to the clinician is being able to cope with problems presented by both elicited and straight observational assessment of the turntaking (initiate-continue-response) sequences of communication. This strategy relies on an interview conducted with an informant familiar with the child's communicative behavior (or) the recoding of a diary by someone who spends a great deal of time with the child being assessed. This technique avoids the *exhorbitant* use of clinician time involved in observational assessment. Additionally, this technique does not destroy the interactional flow as elicited assessment would do (e.g., in elicited, the clinician is always the initiator and the child is the responder). One problem frequently associated with the interview is the general inability of the assessor to specify precise descriptions of the cognitive, social and motor parameters (to be discussed in next section) which must be considered in the observation of early communicative behavior. On the other hand, proponents of interview assessment suggest that this assessment strategy provides the opportunity for the clinician to at least locate areas of import to the parent and child care workers. These areas may well be the most likely to be supported in residential ward or home programming.

In an effort to examine the reliability of an interview procedure, we conducted an investigation in which each of eight (8) child care workers were given a questionnaire designed to elicit information about a particular child under their care. Information was obtained in the areas of visual and auditory localization, vocalization and object permanency. Two experienced communication interventionists independently observed the same children. After one and a half hours of observation, each interventionist completed a questionnaire identical to the questionnaire completed by the child care worker. Secondly, the interventionists observed an additional 1 1/2 hours (total of three) and once again responded to the questionnaire. Thirdly, an additional two (2) hours of observation was completed by the interventionist. Results indicated that the greater the length of professional observation, the higher is the reliability between professional interventionists and childcare workers.

	Cumulative hours of observation		
mean percent agreement between child-care worker and professional interventionist.	1 1/2	3	5
	.52	.62	.71

These results suggest to us that child care workers can be reliable and credible observers and recorders of children's behavior. However, the results of the childcare worker observations need to be placed in perspective. In this investigation, childcare workers were *not* required to make fine behavioral discriminations. The information obtained was valuable in planning more specific assessment activities. Thus its basic value was served to screen behaviors and signal specifics for the professional to attend to more carefully.

Over the past several years, we have come to rely less and less on a single strategy of assessment (observational, elicitation, interview). Instead we depend upon an in tandem use of all three strategies.

Integration of Assessment Procedures

Perhaps the best way to view the construction of an assessment battery (for a severely and profoundly handicapped population) is to picture a child making a snowball. The first component skill in packing a snowball is to scoop the snow. Our first attempts to assess the communicative skills of children that reside in the residential facilities involves "scooping" in all the available data. This data comes from the child's medical file, activity therapy reports, nursing notes, and any other evaluative data located in the child's folder. From the available information, we attempt to outline areas of assessment omission. When we locate an area where a previous assessment was completed, we note the results and the date of the report. All of the information collected from reports and program evaluations is transferred to a summary worksheet.

Frequently information obtained in the child's records are not up to date or appear to be incomplete. Even when the presence of the behavior or skill is reported there has generally been little attempt to report where and under what conditions the behavior occurs. Additionally, there is little mention of the frequency with which the behavior occurs. Another usual finding is the failure to place reports of antecedent and consequent behaviors in relationship to the emission of a given behavior.

Returning to our snowball making analogy, we know that after a person scoops snow for a snowball, the next task is to pack the snow tightly. Likewise, dealing with the data obtained from the child's file and records requires much the same effort. Reports of communicative behaviors located in the child's records must be placed under the scrutiny of what is currently occurring in the environment: the home, the ward, the classroom, etc. If the classroom teacher is carefully utilizing a systematic approach to his/her instructional curriculum, obtaining such information presents little problem. The question, however, presents a formidable challenge to the potential communicative interventionist when looking at what is happening in the home or residential environment.

Our approach during the past several years has been to utilize the childcare worker as a formulator of hypotheses. For example, the childcare worker suggests that the child does not produce imitative vocalizations. We ask what vocalizations the child produces spontaneously. On the basis of this data, we construct an elicited assessment device to administer to the child to test the childcare worker's hypothesis. If the childcare worker's hypothesis is borne out by the elicited protocol, we consider his/her hypothesis to have been confirmed. If, on the other hand, the child does not conform to the expectations provided by the childcare worker, an observational protocol (often using time sampling) is constructed. The act of attempting to confirm the worker's hypothesis is similar to a test to see if a snowball is packed. Unfortunately until a snowball is thrown, it is difficult to determine its compaction status. The construction of elicited and observational assessment protocols may be likened to the throwing of the snowball to determine whether it will stay together.

Assessing Modality Use

The behavioral modality which one might expect to observe children use in expressive and receptive communication has been reported by several investigators (Huttenlocher, 1974; Chapman, 1974; Smith, 1972; and Chapman and Miller, 1975). Huttenlocher has observed that behavioral compliance to commands is probably an inappropriate response modality to use in assessment until the child has demonstrated behavior connoting a twelve (12) month developmental level. Chapman (1974) has suggested that one cannot expect to use a question asking strategy until the child is functioning at approximately a twenty-four (24) month developmental level. Smith (1972) concluded that picture pointing tasks were generally inappropriate until at least an eighteen (18) month developmental level was noted. This limited review of response modalities most frequently used in communicative assessment batteries suggests that other reliable response modes must be used if we are to ascertain even the most general estimate of the child's communicative competence.

The search for a behavior already exhibited by the S/PMR child that can be used as an indication of the child's communicative ability is complicated by the child's motor as well as social and cognitive deficiencies. The combinatory effects of these deficiencies results in profound constraints upon the child's ability to produce communicatively intentional sequences using these same modalities.

In the case of input stimuli, it is our goal to locate those sensory modalities that are most accessible to the child. In the case of output stimuli, our goal is to find a means to indicate that is efficient and effective for the child. Most S/PMR children will have limited (and often no) verbal or

vocal communication skills. A substantial number of early assessment, subsequent intervention packages, perseverated in the belief that the vocal mode was the foundation of the child's communicative output and the basis for subsequent communication development (Hollis, 1977). Predicated on the basis of the literature thus far reviewed, it is apparent that modalities other than vocal/verbal are responsible for a substantial proportion of early communicative emissions. It is also apparent from the literature that the child's motoric reactions to stimuli play a significant role in the demonstration of early receptive communication in a relatively free operating environment (Huttenlocher, 1974; Bates, 1976; Garvey, 1974). Reference to Table 1 demonstrates that modality functions play across all content areas and process functions in the development of a communicative or precommunicative system.

After viewing the supplementary communicative behaviors and the precommunicative behaviors to which they relate, we have concluded that *unless assessment data reveals useful communicative modalities as well as the specific precommunicative or communicative intents,* the accurateness of the communicative assessment in revealing the child's true communicative status could be significantly skewed. Miller, Reichle and Rettie (1977) in a pilot investigation of normal children aged 15-20 months observed that the three most frequent responses to adult demands are a) ignore; b) look at the object mentioned (or object on which an activity is to be performed, or, c) point or point and vocalize to the object mentioned in an apparent attempt to comply with the command or request issued. This preliminary data would suggest that the clinician and teacher working with severely retarded children is apt to see a considerable number of unclear responses but also a substantial number of demonstrations of comprehension. Additionally he/she is likely to see a number of behaviors that appear to demonstrate comprehension, but actually do not.

The Antecedent-Consequent Relationship in Early Comprehension

Chapman (1976) has summarized precomprehension strategies exhibited by early communicating children. These strategies involve the use of motor and visual communicative forms that appear to demonstrate comprehension when in fact the child did not comprehend. For example, I give the command, "Look at the doggie." Immediately upon issuing the command I shift my focus of attention to the doggie. The child may appear to be demonstrating comprehension ability by shifting his/her gaze to the dog. Actually, his/her shift might have been nothing more than gaze imitation. A variety of comprehension strategies are outlined in Table 2. An indepth discussion of comprehension strategies can be found in Chapman (1977).

The fact that comprehension strategies may be observed in normal as well as intellectually delayed children should not be considered a source of frustration to the assessor or interventionist. Instead they should be viewed as opportunities to quantify communicative awareness. Following an adult's shift in gaze, for example, is an awareness behavior that is typically observed in the fourth or fifth month of life. If a SMR-PMR child exhibits contingent shift of gaze, some valuable information has been obtained. After discovering that the child responds to another speaker through the avenues of commonly utilized comprehension strategies, the assessor's job becomes one of controlling antecedent events. The reason being that the child's ability to demonstrate comprehension and production via simple strategies is reduced.

Coltman and Rieke (1977) have suggested the systematic assessment of environmental antecedents, child response, child initiation and environmental response. Our approach suggests that this level of assessment is perhaps best completed through observational time sampling techniques discussed earlier. In the case of locating potential precommunicative strategies and isolating the extent of their use it may be necessary to rely on elicitation procedures whereby the antecedent events can be a priori specified. The importance in this instance of the observational protocol may well include:

1. What was the form of the communicative behavior emitted?
2. How frequently were communicative behaviors emitted?
3. What proportion of the emitted communicative behaviors were initiated and what proportion was responding?

It is possible that observational assessment will also yield the intent of the initiated communicative behavior. It is also possible however that antecedent events may have to be manipulated in order to determine. . .

Table 3

Summary of Nonlinguistic Response Strategies and Comprehension Strategies

Chronological age	Cognitive age	
8-12 (mo)		1. Child attends to objects that another attended to.
8-12 (mo)	Sensorimotor Stage 4	2. Child acts on objects that s/he noticed.
		3. Child imitates ongoing action of another.
	contextually determined responses	4. Child attends to object mentioned and: a) gives evidence of notice b) does what s/he usually does in the situation
12-18 (mo)	Sensorimotor Stage 5	
	lexically cued contextually determined responses	
18-24 (mo)	Sensorimotor Stage 6	5. Child locates the object mentioned and: a) does what s/he usually does . puts objects in containers . exhibits functional use of the object

**Adapted from Robin Chapman (1977)*

4. What was the communicative intent of the utterance form that was emitted?

The combinatory use of elicited observational and interview assessment techniques applied to gather information relative to these four questions in a variety of communicative situations provides the structure for our assessment attempts. The specific corpus of behaviors of interest discussed in the next section will also be considered as methods of intervention.

It is also clear from our discussion that while our previous attempts to assess communicative behaviors (Miller and Yoder, 1972) have focused on the content of the behavior, in this chapter we are dealing more with the means of assessment. For a more indepth discussion of assessment techniques suitable for an S/PMR population functioning between zero and two years of age see Miller, Reichle and Branston (1977).

Early Intervention Strategies

Our need for advances in early communicative curriculum have been called for by teachers of S/PMR children. Of the teachers surveyed, Lynch, Shoemaker and White (1976) report that communicative skills programming was most frequently cited as the critical area of need.

In addition to the specification of curriculum, greater specificity is needed in the area of curriculum implementation in an ongoing program of intervention. The remainder of our discussion represents a sharing of our experiences in the critical aspects of, what for lack of a better term we shall call, *intervention strategies.*

Constructing an Interaction Curriculum for the Caregiver

A number of years ago, Burton Blatt heightened our awareness of the deplorable conditions in institutions housing severely handicapped children. Our limited ecological investigation of the S/PMR child and his/her environment (Reichle and Yoder, 1976) revealed that although facilities may be cleaner, better equipped and better staffed, a noncaretaking interaction between clinicians, childcare workers and children is low. Prior to beginning our 1976 investigation, we hypothesized that we would find childcare workers displaying adherence to the operational rule of minimal undesirable contact.

Minimal undesirable contact states that individuals avoid interactions with children exhibiting extensive inappropriate behavior (e.g., ruminating, tantrumming, pinching). There is a certain degree of relativity to the notion, however, since the rule will permit interaction with a child exhibiting noxious behavior, provided any alternative interactions involve children exhibiting even more noxious behaviors.

To test our hypothesis we utilized a combination of interview and observational assessments. We asked childcare workers, which children they would spend extra time with during their working hours. We then time sampled the frequency of initiated interaction exhibited by the childcare worker to each of the seven (7) children with whom she worked.

Over the course of three months of observation we accumulated over 10 hours of observation on each of eight childcare workers during a number of different periods throughout the day. Our observations included an analysis of initiated motor (giving, showing, pointing, holding, rocking, grooming, etc.) as well as verbal behaviors.

The results of our observational assessment revealed that in seven of eight cases the child that the CCW would most like to spend more time with, was also the child with whom she initiated the most communicative behavior. Interestingly enough, in all seven (7) cases these children exhibited the least noxious behavior of any children in a respective group. Our hypothesis of minimal undesirable contact was confirmed. It was a clear case of the haves getting more attention and stimulation, and the have nots receiving less.

Since the initiation of our investigation data on the motor interactive behaviors between mothers and their children (functioning at a level commensurate with our children) has been reported (Lewis & Rosenbloom, 1977). Although we do not have the time to engage in a full discussion, our comparison of data with our own suggests grossly different frequencies and types of motor initiations and responses (child care worker compared with parent). The specific nature of differences will be summarized in a forthcoming report (Reichle and Yoder, 1977).

At the time of our investigation (without knowledge of Lewis & Rosenbloom's work) the results suggested to us that the curriculum to be implemented would be of little benefit to the child unless

s/he had opportunities to use it. Since S/PMR children are more proficient responders than initiators, we worried over how to get the CCW to administer a program on the ward.

We judged that the involvement of the childcare worker was critical to our curriculum because of our strong bias that early communicative competence is based on interactive mix of initiating responding and interaction continuing motor and vocal behavior.

Our solution to the disparity of interpersonal interaction between CCW and the children with whom s/he interacts was seen as first step in intervention.

In five (5) instances we applied the premack principle to successfully modify the disparity of initiated behavior exhibited between CCW and the children under his/her care. First we established viable communicative curriculums (to be outlined later) for both the CCW's most and least attended to child. We (communication interventionist) then shared caretaking responsibilities during administration of curricula to least interacted with child. If the childcare worker successfully "interacted" with this child, s/he was given extra "free" time to interact with the child s/he initiated communicative behavior to most frequently. Gradually, we decreased the amount of free time (provision of assistant) during the CCW's intervention period with the most frequently interacted with child. In four of five instances we found that up to four months (4) after termination of our intervention with the CCW, her frequency of initiated communicative behavior showed significantly less disparity between most interacted with and least interacted with child.

Our initial approach to intervention then, is three dimensional. First, focus on the interactional characteristics between childcare worker and child, secondly, design a specific content curriculum for child involved, and third, insure that the interaction time between CCW and child extends beyond the teaching session. At the risk of belaboring the point, the third dimension is critical and the one we wish to talk about first. Prior to our implementation of the intervention procedure, we attempted to train CCW's to administer twenty (20) minute intervention sessions. We attempted these sessions with the same eight (8) childcare workers for approximately two (2) months. Of the approximately 140 sessions, there were only 10 that we were able to complete without interruption. Seventy nine (79) of the one hundred and forty (140) sessions had to be terminated prior to their completion. Our results suggested that a far more advantageous approach to intervention was the use of shorter ten minute sessions administered more frequently throughout the day. During two months of intervention using ten minute sessions only 26 of the 280 (two ten minute sessions per day) had to be terminated.

After approximately four (4) months of cooperative program modeling with the CCW's, we faded ourselves out of the ward environment. We asked the CCW's to record data obtained during each session. After one month (140 possible two- 10 minute sessions per day) we observed that approximately half of the sessions (74) had not been attempted. Of those seventy four, we observed that a high percentage (about 80%) of skipped sessions were with "the least interacted with children." It was at this point that we instituted our program relying on the premack principle.

It may sound as if the CCW is the scape goat of our efforts to explain why some intervention paradigms fail. The ultimate responsibility for frequent failure of on-ward programming must not be with the childcare worker but with the interdisciplinary professional team.

Reichle (1977) examined the interdisciplinary on-ward programming assigned to CCW's. In reviewing programs assigned to the same eight (8) child care workers previously described, it was found that each CCW had a mean of 6.5 programs to administer with each of the seven (7) children in her charge. Each CCW then was responsible for administering approximately forty-six programs per day in addition to her child care activities. This situation places the CCW in somewhat of a "catch 22" position. Either she 1) sloppily attempts to administer all programs without proper monitoring procedures 2) refuses to attempt all programming or 3) fabricates data on all of the programs without administering programs. Reichle's (1977) observation suggests that clinicians and CCW's often operated under the fantasy that all programs were being carried out even though it was clearly evident that the programs were not. The uncomfortable situation that is forced upon the CCW results from unreasonable interdisciplinary expectations of how the CCW's time must be allocated.

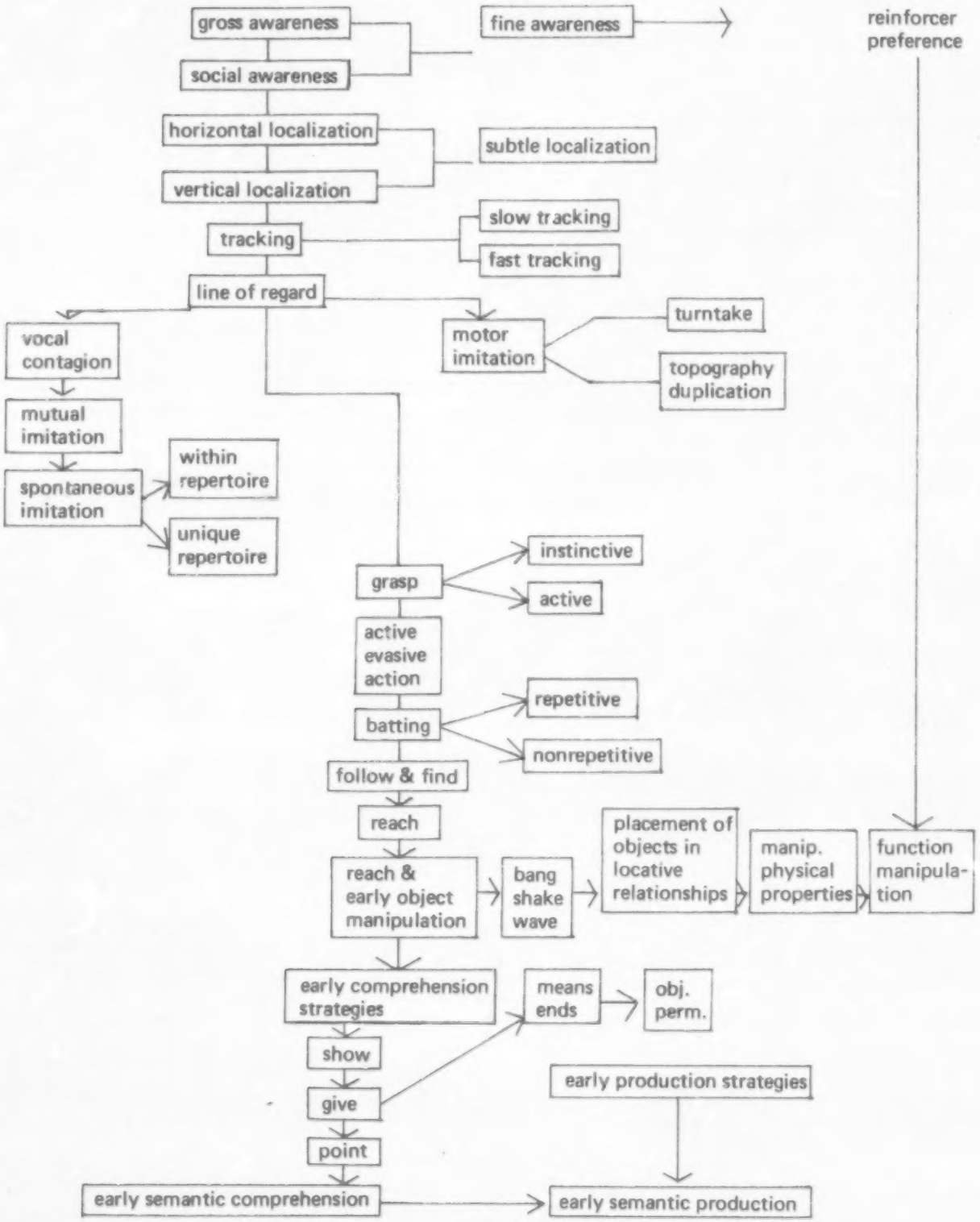
The preceding are concerns traditionally ignored. They are issues, however, that must be dealt with if curriculum (regardless of its quality) is to have an impact upon the S/PMR child's environmental functioning. Even the most carefully built car will not move without fuel.

Constructing a Communication Curriculum for the Child

Often we find ourselves in the position of being asked to recommend curriculum and teaching procedures for children that have failed in numerous previous attempts to establish communicative behavior. The program discussions that follow represent the struggle of our attempts to integrate curriculum toward the goal of a communicating child. The program content and teaching procedures that we will discuss require a transdisciplinary effort just as did our format for assessment. The curriculum that we have chosen to advocate stresses the difference between communicative means (imitation-response modalities) and the communicative intents which are conveyed. The abbreviated curriculum presented here is a portion of a more extensive curriculum currently under development (Reichle, Yoder and Starr, 1975).

The following outline will be discussed in this section.

Components of Curriculum Leading to the Establishment of Early Communicative Behavior



A. Awareness

Earlier we described the origins of the early communicating child's means of expressing communicative intent. Throughout the first four piagetian sensorimotor stages (0-12 mo.) there appears to be no overt communicative intent (Bates, 1976). Instead the child demonstrates awareness of environmental events and a limited amount of comprehension beginning around eight (8) months of age via comprehension strategies (previously discussed).

The earliest attempts at precommunicative awareness have generally been discuss in terms of startles, cessation of movement, smiling, crying, blinking, localizing, tracking etc.. .....to a stimulus presentation.

Our initial attempts at precommunicative programming require the child to be able to demonstrate an awareness of changes in the environment.

The child's responsibility to a variety of overt changes in the environment demonstrates a basic level of awareness. Additionally, however, emission of a gross awareness response marks the beginning of the process to locate the nature of response modes present in the child's repertoire.

In obtaining responses in gross awareness programming, we have observed that even in the most overt stimulus presentations there is a range of subtlety. Northern & Downs (1974) have provided substantial quantification of this phenomena in an auditory mode. With most children we have been able to establish a continium of stimuli from overt to subtle. Through procedures of cue fading and frequent stimulus changes it is possible to transform a child's gross awareness into a finer awareness.

B. Localization

There are a substantial number of paradigms reported in the literature as facilitative of early response modes involving localization and tracking (Kiernan and Jones 1976). Although the preceding response modes offer hope to the teacher of the "nonresponsive child" there are numerous pitfalls in their establishment. It is possible to establish behaviors that appear to be representative of early awareness which are in fact little more than rote head movements. True tracking and localization skills are searching strategies that serve as confirmation of environmental awareness. The establishment of a rote motor response not indicative of a search strategy may be seen in an example of an attempt to teach localization behavior. Unless the interventionist uses a variety of stimuli and several different position placements of objects, it is probable that the child will learn simply, "When I hear the bell I turn my head left, or when I hear a whistle, I turn my head left." A second pitfall in training localization comes when clinicians cease training immediately after localization behavior is exhibited to an intense *stimulus*. We have generally found that S/PMR children frequently begin to fail to localize as either the stimulus characteristics of intensity, frequency or both are altered. Consequently, we continue localization training until the child will localize to a verbal stimulus presented at a conversational level.

Normal children typically learn to localize to an auditory stimulus at 3-4 months of age along a horizontal plane and 7-8 months along a vertical plane (Northern & Downes 1974). If the child is truly learning a localization strategy, when presented with an as of yet unsolvable problem (presented a stimulus requiring vertical localizations when s/he has only horizontal localizations) s/he will continue to search for the source.

There are a variety of reflexive behaviors that may be elicited in the course of localization or gross awareness training that may appear to approximate a response. These elicited behaviors are generally representative of reflexes that have not yet been inhibited. They are in many respects comparable to the early comprehension strategies in terms of their ability to skew a response. Some of these reflexes may result in false positive localizations. In the following table these reflexes and their possible effects are outlined.

Summary of Selected Early Righting and Equilibrium Responses Serving as Early Spurious Indications of Precommunicative Awareness

Chronological Age	Reflex	Normal Inhibition	Stimulus Eliciting Reflex	Description	Spurious Effects of Prelinguistic Programming
birth - 4 mo.	neck righting	gradually diminishes	turn child's head to one side	body will turn as a whole to side head is turned	if random head turn immediately prior to stimulus presentation; subsequent body turn can be misconstrued as response in localization
4-6 mo.	body righting reflex acting on the head	1 yr. to 5 yr.	child's feet on hard surface (or) student side lying on hard surface	head is brought into alignment with trunk of body	if child's position is changed immediately prior to stimulus presentation in tracking or localization, an apparent response may be exhibition of this reflex
12-14 mo.	sitting equilibrium	exists throughout life	while in sitting position; push child to one side	head moves to side of body that is higher; arm and leg of raised side as well as nonraised side straighten out from midline	if child is in awkward sitting position tracking and localization responses will be less likely to be seen on nonraised side
	Reflexes inhibiting precommunicative responses				
birth - 4 mo.	asymmetrical tone neck reflex	gradually diminishes	head is turned to either side while child is lying on back	extention of arm and leg on the side to which head is turned & flexing of arm & leg on opposite side	*gross awareness* . makes rolling over impossible follow and find . can prevent child from getting both hands to midline
1 - 2 mo.	tonic labyrinthine	up to 4 mo.	place child on stomach or on back	back arches, legs and arms straightened, head pushes back	vertical localization . difficult to raise head

Several actions may be taken to minimize the spurious effects of reflexes in localization training. Sternat, Messina, Lyon & Nietopski (1977) have described procedures to facilitate head rotating, head balance, and head righting skills. These skills provide a strong foundation for progression to localization training.

One other comment must be made with respect to localization. It has been of experience that programming using physical prompting of the head in an appropriate direction often defeats the purpose of localization training. The eyes will maintain a midline position even though the head has been moved. We usually have relied totally upon the unique qualities of the stimuli, and their ability to be magnified in cueing to obtain responsibility. Localization represents a visual response which when paired with subsequent motoric modes will result in more efficient initiated responses through a more efficient analysis of the communicative situation by the child.

C. Tracking

The emergence of tracking behavior generally is subject to the same comments relevant to localization. Tracking, however, serves as a more efficient means to orient oneself to a given environment as there is no need for an emission from the object in order to orient oneself.

The twenty (20) children with whom we have implemented localization programs typically emit appropriate localization behavior given an overt enough cue. The paradigm then consists of procedures to fade cue overtness. Reductions in stimulus overtness include 1) intensity, 2) distance of stimulus from child, 3) unique characteristics of the object itself, etc. The most subtle form of behavior incorporating localization skills (and early imitative skills) has been described by Bruner (1975).

D. Line of Regard

Bruner (1975) has described a behavior in which the child and adult are mutually attending. At around four (4) months of age, an interesting phenomena occurs. If the adult breaks eye contact with the child (e.g., looks out the window) for no apparent reason, the child will also look in the direction that the adult looked. This gaze diversion may well represent an early bridge between localization behavior and early imitation behavior.

E. Diverted Gaze

Initial gaze aversion programming attempts involved placing one object in front of the child. Once attending behavior was established, a second object was presented to which the appropriate response was a localization. Gradually the overt features of the second object were reduced (e.g., while looking at object A, the clinician presented object B, while saying Tommy- "name of object"). Eventually, two objects were placed on the child's tray. If the child looked at object A, and then successfully diverted attention to object B, the child was reinforced. Over the span of intervention, objects presented on one tray represented natural reinforcers (e.g., coke, honey). As the child gazed to an object that reinforcer was delivered.

F. Imitation

Motor imitation has characteristically preceded attempts to establish early language skills. The procedures that we have developed to promote the establishment of communicative skills do not de-emphasize the importance of motor imitation. Instead we choose to view the development of motor imitation and vocal imitation as "in tandem" skills. We have chosen to operate utilizing a contiguous training paradigm in which both motor and vocal imitation may be the focus of intervention simultaneously. Our rationale for a contiguous curriculum focuses on the fact that we have little way to predict what mode of communication (visual, verbal, motor) may be the most effective for any given child. Additionally, there is a little evidence from normal developmental data that a child must exhibit motor imitated behavior prior to vocal imitative behavior or visa versa. Initial contiguous training frequently serves to enlighten us to the potentially more useful response mode for the child.

There are several components of many currently available motor and vocal imitation programs that cause a great deal of frustration to the proponent of a normal developmental model. The first of these relates to the selection of motor behaviors to be established in motor imitation training. Traditionally, behaviors such as hand clapping, hands on head, etc., have been chosen for training. The main rationale for selecting to train these behaviors is ... that the clinician can reliably establish that

the child's behavior is strictly a result of training procedures, and is not learned in other ways. The corpus for early imitative behaviors that we have selected for training represent approximations of manual signs (SEE, ASL, etc.). If we find that a verbal response mode is not suited to the child, then we have already established some basis for a manual signing program in the process of early motor imitation.

The second feature of imitation training that frequently strikes us as being quite inappropriate relates to the establishment of vocal imitation. Earlier in this chapter, we described the emergence of vocal contagion, mutual imitation and spontaneous imitation. That research evidence suggests that a child who is not yet emitting spontaneous vocal imitations may be appropriate for training in mutual imitation. We have attempted to train vocal production skills using mutual imitation with children unable to acquire spontaneous imitation. Our subjects were three(3) S/PMR children who appeared to be functioning in sensorimotor stage 3. All three children were emitting spontaneous vocal behavior. None of the vocal behavior exhibited, however, demonstrated any contingency with adult utterances. All three children had been participating in daily vocal imitation programming (five days a week) for over eight (8) months without significant improvement over baseline performance (which ranged from 0-15%). The teaching procedure used consisted of waiting until the child vocalized. When the child did vocalize the interventionist imitated the child. An appropriate response on the part of the child then consisted of imitating the adult (C-- A--- C). Initially it took a mean of one hour to obtain enough child vocalizations to constitute ten (10) trials. After a mean of 254 trials, all three children were *mutually imitating* with sixty (60) percent accuracy or better (range of sixty (60) to seventy-five (75) percent). Our results suggest that a paradigm to train mutual imitation may prove successful with those children not yet ready for entry into a program of spontaneous vocal imitation. Whether or not the establishment of mutual imitation in in a S/PMR child wiil facilitate the subsequent spontaneous vocal imitation is at present unknown. There is an interesting twist to conclude our discussion of vocal imitation. Most of the currently available procedures used to establish vocal imitation do not include an assessment of mutual imitation skills. Typically, the assessment paradigm calls for the child to be positioned across from the assessor. The assessor initiates the sound to be imitated by the child. This paradigm allows no potential for assessment of mutual imitators. One hypothesis for the somewhat less than 50% chance of teaching vocal imitation may lie in the skills that the child brings to the task. It is possible that many children that succeed in spontaneous vocal imitation programs are already mutual imitators.

There is yet another consideration in the training of early imitation skills. Imitation is another name for exacting turntake. Exacting turntake implies that there are two things that the child must appropriately accomplish. First, s/he must produce the appropriate topographical features of a behavior produced by someone else. Secondly, s/he must produce that behavior at the right time. In mutual imitation the former demand is simplified in that the child chooses the topography of the behavior. That suggests that *mutual imitation equals turntake,* while *spontaneous imitation equals turntake plus topography matching.* There is ample evidence to suggest that normal children first learn to imitate those behaviors that are exhibited in their repertoire but not yet established imitatively. Unfortunately, there is a sparcity of evidence to confirm this finding in S/PMR populations.

Our views on the value of training imitation are that it teaches a child to 1) turntake and 2) attend to salient features of a stimulus presentation and 3) replicate those salient features. Our criticism of many existing imitation programs is that they have not looked at imitation as a two part paradigm in which mutual imitation is a skill which precedes spontaneous imitation. Consequently, imitation is taught as if it were a single behavior. It is our notion that this is why imitation programs frequently fail.

G. Grasp and Reach

Held and Bauer (1962) have suggested that the act of reaching for a visable target by an adult would appear to depend upon a person's ability to 1) orient eyes and body to a stimulus and 2) match the direction of reaching the hand with the actual or potential orientation of the head to the target. The child's initial attempts at approximated reach behavior are evidenced when the child moves his/her limbs and visually attends to this movement. Initially, then one would expect to see the child actually viewing his/her hand as an object to which attention may be given.

Rubinstein (1967) has indicated (as previously mentioned) that as little as twenty (20) extra

minutes of handling during the first month of life had a significant effect upon the development of such visual attending and reaching behaviors.

Bruner has reported that at four weeks the "grasp reflex" proper reaches its full strength and that its resultant effect upon reaching involves the catching and holding of the object contacted. Originally a distally-moving contact stimulus between the forefinger and thumb evoke abduction of those two digits. Later the reflex is exhibited to the other fingers. The grasp reflex can be elicited only by direct contact. Consequently, early portions of training reach involve the need for tactile cueing.

In traditional reaching behavior, the stimulus object is displaced from the child and the child must serve as the agent in the act of reaching. One procedure that we have utilized in order to establish spontaneous reach, has been to shift the locus of the agent of the action.

At about four months of age the child exhibits behavior described by Twitchell (1965) as an "instinctive grasping reaction." Bruner (1967) has referred to this same behavior as "groping." When there is a light tactile cue to the ulnar or radial side of the hand it (the hand) will orient to the stimulus.

Voluntary reaching activity is seen sometime after the recession of most of the instinctive manipulatory activity. Bruner (1967), Piaget (1952) has stressed the importance of visual scanning of the reaching hand and the object being reached for, as being crucial.

We have experienced substantial difficulty in our attempts to obtain emission of reaching behavior. If it is true, as Held and Bauer (1962) suggest, that matching the direction of reaching with the orientation of the head is crucial, then a procedure designed to optimize both should effectively stimulate reaching.

One procedure that we have successfully used requires moving an object toward a collision course with the child's face. As the object approaches, the child fixates. As the object nears collision with the face the child will attempt to reach up to bat the object away. Bruner (1967) has explained that initially the child will attempt to raise his/her arms up although s/he may not make contact with the object. At later periods in time, the child becomes able to bat the object away (active evasive action).

Over successive trials the movement of the object toward the child is discontinued further and further away. Eventually, the child extends his/her arm slightly to bat. When the child will bat several times at a stationary object, repetitive batting and what may well be early spontaneous play has been established.

H. Follow and Find

In our initial training, an object is the agent of action as it touches the child's hand. As the child motorically matures and begins to coordinate hand and eye movement, the object may be presented and the child will *initiate* grasping directed to the visual presentation (without tactile cueing). The point at which the object is stationary, and the child moves to grasp the object upon visual presentation, the child has become the agent.

In the early phases of reach training we have found it useful to rely upon stimulus fading procedures to transition from a child response, to object movement, to an object reaction, to a child initiated reach. The program used to establish this transition we call *follow and find.* Initially we tap the child's hand with an object. The object is moved slightly away from the child's hand. The child's task is to re-establish contact with a short reach and grasp. Over the course of successive trials, the object is moved further and further away after it has been tapped on the child's hand. Eventually, the object is placed in a stationary position in front of the child. The child's response, at this point, requires an *initiation* in the direction of the object, using his/her recently acquired reach and grasp skills. Bruner (1967) has made the observation that in early development reach and grasp are often inefficient. Between the launching of the hands toward the object, and the subsequent grasping of the object, the eyes of an infant may close until the fingers make contact with the object. This observation may suggest that children exhibiting visual impairments may be at little more disadvantage than normally sighted children in the initial phases of programming. In our own experience with two blind children that have been programmed in follow and find, they progress no more slowly than normally sighted children operating at commensurate cognitive levels.

I. Functional Use of Objects

At the time that the child has acquired some limited ability in acting upon objects (reaching and grasping) it becomes necessary to establish some repertoire of appropriate actions upon objects. The

significance of establishing functional use of objects is a process that has been studied with exacting precision in the normal child. The traditional sequence of the development of object manipulation behavior is from the manipulation of perceptual attributes of objects, to the functional use of objects (e.g., you use a comb to comb your hair, a broom to sweep the floor etc.). Bricker and Bricker (1974) offer an organized program describing the integration of the functional use of objects with an early semantic communicative curriculum.

J. Showing, giving and pointing

The establishment of early turntaking behavior discussed in the context of imitation is a continuously developing skill. After the child has learned to appropriately grasp, bat and reach, these skills are integrated into give and take routines. These routines first consist of showing objects and then showing and giving objects. Finally, the child becomes readily able to point to objects in the environment that are of interest.

Initially we are interested in establishing giving behavior in the child via the traditional instruction following paradigm. The procedure used is simply a pairing of gestural motion, plus the verbal command "give me." Over successive trials (and child successes) the gestural motioning is faded, until only the command "give me" remains. Unfortunately, giving and pointing often go undifferentiated in the teacher's early communication programming.

Pointing is primarily of use when an object of interest is not close enough for the child either to pick up and/or give. The method that we have used to establish the appropriate use of pointing is a three component program. The first component is identical to the "give program." Gradually, motor cueing is faded so that only the command point is present. The second phase of the program requires that reinforcing objects be displaced from the child's reach. The question is then posited, "what do you want?" or "where's the_____?" If the child approximates a point s/he is reinforced. A failure is treated by the clinician directing the child to "Point to_____." As the child's success in this procedure increases, the objects are moved further and further away from the child. At the conclusion of the programming, the child will be able to point to an object in the same room given the mand "where's the_____?" or "what do you want?"

Our discussion suggests that pointing actually consists of two subtypes. One form of pointing is actually touching. Touching, is the behavior emitted by the child using a communication board. The other form of pointing which we shall call extended pointing, involves the use of a point to locate objects in the environment that are not directly available for handling. Both types of pointing are important in the establishment of generalizable communicati e emissions.

After we have estabiished a communicative response mode for the child such as pointing, we attempt to create situations in which the child will be forced to initiate rather than just respond using the forms that we have established.

K. The Initiation of Communicative Intent

Although many intervention protocols require children to give and/or point to objects, several constraints are evident. Usually the child learns to give only after the command "to give" has been issued. Secondly, pointing responses are typically taught to be used in situations where the child could have just as easily picked up the object. Consequently, the major use of a point (giving information about or demanding a displaced object) is never established. Additionally as with give, the child is very infrequently reinforced for self initiated pointing. In order to confirm that the child can adequately use his/her motoric repertoire to emit communicative intent s/he must do so in manded as well as nonmanded (initiated) situations.

If, a child has demonstrated that s/he uses some form of behavior to demand (scream, cry, etc.), we simply construct situations similar to those where s/he emits the inappropriate demanding. While in that situation we ignore the inappropriate demand, and supply him/her with the appropriate demand form. For example, one child with whom we worked exhibited a high frequency of screaming behavior which was always referred to as "temper tantrumming." Upon an ecological assessment of the child's behavior, we discovered that the screaming behavior was emitted only when the child wanted something. The child did *not* scream when demands were placed upon her, and she was in fact a compliant child. A communication board (motor pointing) had been chosen as her mode of communication. We hypothesized that given more appropriate methods of seeking attention, the child's screaming would decrease. We placed a buzzer for signalling desired attention as one of the

symbols on the child's board. After five (5) half hour sessions screaming behavior decreased from a base rate mean of 32 instances per day, to 7 instances per day. It has been our experience that frequently children who are labeled as being non-initiators of communication, actually initiate messages but do so inappropriately.

Unfortunately in some instances no forms of communicative initiation can be observed. In those cases we have found that the establishment of initiated communicative forms requires a very strong reinforcer. The teaching procedure involves the use of a procedure to first fade the stimulus object out of the reach of the child. Next the verbal request uttered by the clinician "what do you want?" is faded. Next, the clinician is faded to the extent that s/he is only within the child's field of vision (and the object is not within reach, but is within the child's visual field). Finally, the clinician moves out of sight, but the object remains in sight. The last step of the fading paradigm requires that the stimulus object be faded out of sight. At this point the child is using completely initiated communicative skills. It is also during the last several steps of the program that the importance of object permanency is witnessed. If the child cannot locate an object that is out of sight, s/he will certainly not be capable of communicative initiation in the sophisticated sense of initiation.

The former discussion deals with how to establish initiated demands and requests. Initiated indication to communicative is somewhat more difficult. Bates (1976) has described a protodeclarative in terms of an effort to acquire another's attention. Unless the child is particularly reinforced by attention, it is extremely difficult to establish the communicative skills required for example to say (look at the dog). Our best attempt to establish initiated declaratives (indicatives) has been in the context of activities that involve the generation of information to appropriately respond to where questions. Upon answering the question the child is reinforced with either praise or praise and edible. Simultaneously, the child is reinforced throughout the day for spontaneous pointing or using the modality indications of objects. We have used this paradigm with mixed results. Our best successes have occurred in cases where the clinician was able to effectively utilize social reinforcers without the need of primary reinforcers.

The previous discussion readily demonstrates the importance of establishing a response modality. The content for that response modality is generated and the initiated as well as responded applications of communicative intents.

For the most part our discussion has focused on the precommunicative curriculum. Unlike some of our colleagues, we believe that cognitive skills can be stimulated through consistent programming efforts.

In the preceding pages we walked through a discussion of our framework for an effective assessment strategy and provided some specific examples of behaviors we assess. To this framework we have applied a process of intervention which *cannot be used as a total curriculum in and of itself.* Instead, it should be used as a supplement to the sparcity of precommunicative programs in existence for S/PMR children. One caution must be given to the teacher or clinician. It is not a sound practice to teach the behaviors discussed here in isolation. It has been our finding that the most effective programs are administered in maintenance activities throughout the course of the play. Some of these activities may be found in Table 5.

It has taken us nineteen years to come to grips with the fact that Roger Brown's (1958) question "How shall a thing be called?" is a bit premature with an S/PMR population. Instead, let us suggest that the question is, "How shall early communicative intentions be established and expressed?"

A Concluding Reflection

Historically, we have made great advances in our work with the communicative behaviors of the S/PMR child. The fact that we have begun to explore *various strategies* of assessing, stimulating and intervening in the S/PMR's communication system is progress. The fact that there is still a long way to go is our frustrating challenge. As we learn more about children's communication systems we will acquire more efficient and effective ways to assess and teach them. We eagerly look forward to the time we can look back at these early efforts shared with you circa, 1977, and can say in reflection "my but we've made great advances in our work with the communicative behaviors of the S/PMR child."

Acknowledgement

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Game Type	Example	Skill Facilitated	Time/Place
Hiding games	. peekaboo . pea under the shell	object permanence & visual follow and find	playtime
Turntaking	. child stack blocks adult knock down/ adult stack blocks child knock down . child picks up phone receiver/adult picks up phone receiver . adult makes face . child laughs		

Informal recordkeeping for informal games

. How when and where are games played

. How frequent do you supply S^D
how frequent does child play

. What are high probability
participation tasks

References

Bell, S. and Ainsworth, M. Infant crying and maternal responsiveness: reinforcement reassessed. Unpublished manuscript, 1971.

Brazelton, T. B., Koslowski, B., and Main, M. The origins of reciprocity. The early mother-infant interaction. In Lewis and Rosenblum (eds). The effect of the infant on its caregiver. Wiley, New York, 1974.

Brazelton, T. B., Tronick, E., Adamson, C., Als, H. and Wise, S. Early mother-infant reciprocity in Parent-Infant interactions. Elsevier, Amsterdam, 1975.

Brazelton, T. B., Tronick, E., Adamson, C., Als, H. and Wise, S. Early mother-infant reciprocity. In M.A. Hofer (ed). The parent-infant relationship. Summit, N.J.: Chemical Industries of Basil Associated Foundation, 1975.

Browne, G. Y. Discrimination of normative facial expressions by 12-week-old infants. Proceedings of Meeting of the Society for Research in Child Development, 1975.

Bruner, J. The ontogenesis of speech acts. Journal of Child Language, 1975, 2, 1.

Bruner, J. and Sherwood, V. The game of peekaboo: unpublished, Oxford, 1974.

Call, D. J. and Marschak, M. Styles and games in infancy. Journal of the American Academy of Child Psychiatry, 1966, 5, 193-211.

Carpenter, G. C. Mother-stranger discrimination in the early weeks of life. Proceedings of Meeting of the Society for Research in Child Development, 1973.

Chapman, R. Comprehension strategies in children. In J. Kavenagh, W. Strange (eds). Implications of Basic Speech and Language Research for the School and Clinic, 1977.

Chapman, R. Discussion summary-Developmental relationship between receptive and expressive language. In R. L. Schiefelbusch and L. L. Lloyd (eds). Language Perspectives, Acquisition, Retardation and Intervention. Baltimore: University Park Press, 1974.

Clark, E. V. What's in a word? On the child's acquisition of semantics in his first language. In T. E. Moore (ed). Cognitive Development and the Acquisition of Language. New York: Academic Press, 1973. pp. 65-110.

Coggins, T. Early semantic development in retarded children. Unpublished doctoral dissertation, University of Wisconsin, 1976.

Condon, W. S. and Sander, L. W. Neonate movement is synchronized with adult speech: interactional participation and language acquisition. Science, 1974, 183, 99-101.

Condon, W. S. amd Sander, L. W. Speech interactional participation and language acquisition. Science, New York, 1974, 183, 99-101.

Condon, W. S. and Sander, L. W. Synchrony demonstrated between movements of the neonate and adult speech. Child. Devel., 1974, 43, 456-462.

Cromer, R. The cognitive hypothesis of language acquisition and its implications for child language deficiency. In D. Morehead and A. Morehead (eds). Normal and Deficient Child Language, Baltimore: University Park Press, 1976.

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Dore, J. A pragmatic description of early development. Journal of Psycholinguistic Research, 1974, 3, 343-350.

Dunn, J.F. Consistency and change in maternal style. In M. O'Connor (ed). The parent-infant relationship. London: Academic Press, 1974.

Edwards, D. Sensorimotor intelligence and semantic relations in early child grammar. Cognition, 1973, 2, 395-434.

Garvey, C. Some properties of social play. Merrill Palmer Quarterly, 1974, 20, 163-180.

Greenfield, P. and Smith, J. The structure of communication in early language development. Academic Press, New York, 1976.

Guess, D., Sailor, W. and Baer, D. A behavioral-remedial approach to language training for the severely handicapped. In E. Sortag, J. Smith and N. Certo (eds). Educational programming for the severely and profoundly handicapped. Special publication of the Division on Mental Retardation, The Council for Exceptional Children, 1977.

Huttenlocher, J. The origins of language comprehension. In Ril. Solso (ed). Theories of Cognitive Psychology. Lawrence Cribaun Association, 1974.

Inhelder, B. Cognitive development and its contribution to the diagnosis of some phenomena of mental deficiency. Merrill Palmer Quarterly, 1969, 12, 299-319.

Jaffe, J., Stern, D. N. and Perry, J. C. 'Conversational' coupling of gaze behavior in prelinguistic human development. Journal of Psycholinguistic Research, 1973, 2, 321-329.

Kahn, J. V. Relationship of Piaget's sensorimotor period to language acquisition of profoundly retarded children. American Journal of Mental Deficiency, 1975, 79, 640-643.

Kaye, K. Gaze direction as the infants way of controlling his mother's teaching behavior. Proceedings of Meeting of the Society for Research in Child Development, 1975.

Kaye, K. and Brazelton, T. B. Mother-infant interaction in the organization of sucking. Proceedings of Meeting of the Society for Research in Child Development, 1971.

Lackner, J. R. A developmental study of language behavior in retarded children. Neuropsychologia, 1968, 6, 301-320.

Lamb, M. A re-examination of the infant social world. Human Development, 1977, 20, 65-85.

Lamb, M. E. The one-year-old's interaction with its parents. Proceedings of the Meeting of the Eastern Psychological Association, 1976.

Lamb, M. E. Interactions between eight-month-old children and their fathers and mothers: In Lamb, The Role of the Father in Child Development, Wiley, New York, 1976.

Lewis, M. and Freedle, R. Mother-infant dyad: the cradle of meaning: in Pliner Krames and Alloway. Communication and affect: language and thought, Academic Press, New York, 1973.

Lewis, M. M. Infant speech: A study of beginnings of language. London: Routledge & Kegan, Paul, 1936.

Lynch, V., Shoemaker, S., White, O. Training needs survey. The American Association for the Education of the Severely/Profoundly Handicapped, 1976, 1, 1-16.

McLean, J. and Snyder, L. A transactional approach to early language training: Derivation of a model system. Final Report, Contract No. OEC-0-74-9185. Washington, D.C.: U.S. Office of Education, BEH, 1976.

Miller, J., Reichle, J., and Branston, M. Assessment of communicative development in the young communicative child. Unpublished manuscript, University of Wisconsin, Madison, Wisconsin, 1977.

Moore, M. and Meltzoff, A. Neonate imitation: A test of existence and mechanism. Paper presented at biennial meeting of the Society for Research in Child Development, Denver, Colorado, April, 1975.

Northern, J. and Downes, M. P. Hearing in Children. Baltimore: Williams and Wilkins, 1974.

Richards, M. and Bernal, J. R. An observational study of mother-infant interaction. In N. Blurton Jones (ed) Ethological Studies in Child Behavior. London: Cambridge University Press, 1972.

Rubenstein, J. Maternal attentiveness and subsequent exploratory behavior. Child Development, 1967, 38, 1089-1100.

Ryan, J. Early language development: towards a communicational analysis. In M. Richards (ed) The integration of a child into a social world. London & New York: Cambridge University Press, 1974, pp. 185-215.

Sagi, A. and Hoffman, M. L. Emphatic distress in the newborn. Developmental Psychology, 1976, 12, 175-176.

Sander, L. W. Infant and caretaking environment: investigation and conceptualization of adaptive behavior in a system of increasing complexity. In E. J. Anthony (ed) Explorations in Child Psychiatry. New York: Plenver Press, 1975.

Sidman, M. Tactics of Scientific Research, New York: Basic Books, 1960.

Soltman, S. and Rieke, J. Communication management for the non-responsive child: A team approach. In E. Sontag, J. Smith and N. Certo (eds). Educational programming for the severely and profoundly handicapped. Special publication of the Division on Mental Retardation, The Council for Exceptional Children, 1977.

Stechler, G. and Carpenter, G. A viewpoint on early affective development. In J. Hellmuth (ed). Exceptional Infant. Vol. 1, New York: Bruner/Mazel 1967, pp. 163-189.

Stechler, G. and Latz, E. Some observations on attention and arousal in the human infant. Journal of the American Academy of Child Psychiatry, 1966, 5, 517-525.

Stern, D. Mother and infant at play: the dyadic interaction involving facial, vocal and gaze behaviors. In Lewis and Rosenblum (eds.). The effect of the infant on its caregiver. New York: Wiley, 1974.

Stern, D. The goal and structure of mother-infant play. Journal of the American Academy of Child Psychiatry, 1974, 13, 402-422.

Stern, D. A micro analysis of mother-infant interaction behavior regulating social contact between a mother and her 3 1/2 month old twins. Journal of the American Academy of Child Psychiatry, 1971, 10, 501-517.

Sternat, J., Messina, R., Lyon, J. and Nietopski, S. Unpublished manuscript, University of Wisconsin, 1977.

Strain, B. and Vietze, P. M. Early dialogues: the structure of reciprocal infant-mother vocalization. Proceedings of Meeting of Society for Research in Child Development, 1975.

Vietze, P., Strain, B., and Falsey, S. Contingent responsiveness between mother and infant: Who's reinforcing whom? Proc. Meetings Southeast Psych. Assoc., 1975.

Watson, J. S. Memory and contingency analysis in infant learning. Merrill-Palmer Quarterly, 1967, 13, 55-77.

Weber, B. Validation of observer judgements in behavioral observation audiometry. Journal of Speech and Hearing Disorders, 1969, 34, 4-350-355.

Wells, G. Learning to code experience through language. Journal of Child Language, 1975, 1, 243-269.

White, B. L., Castle, P. and Held, R. Observations on the development of visually directed reaching. Child Development, 1964, 35, 349-364.

Instructional Strategies for Improving Toy Play Skills of Severely Handicapped Children

Paul Wehman

Teaching severely handicapped children appropriate play skills with toys is an important instructional goal. Constructive interactions with objects in the child's environment may facilitate fine motor development (Friedlander, Kamin, & Hesse, 1974). Secondly, a qualitative analysis of toy play may provide the teacher with an assessment of the child's cognitive functioning level (Uzgiris & Hunt, 1975). A third reason, perhaps of greatest importance, is that most severely and profoundly handicapped individuals have an abundance of free time. (Gozali & Charney, 1972; Stanfield, 1973; Wehman, 1977; 1978a). This is reflected in evenings, weekends, and holidays when the child is at home and most of the summer months. If severely handicapped children are unable to interact with toys and other play materials appropriately, and therefore require constant supervision, many families will feel the need to institutionalize the child.

The purpose of this paper is to identify typical play problems encountered when attempting to teach appropriate toy play skills and to suggest specific strategies for overcoming these problems. The problems are delineated below:

1. Refusal to play.
2. Inappropriate play.
3. Lack of sustained play.
4. Limited range in use of play materials.
5. Isolate play.
6. Refusal to initiate social interaction.
7. Throwing of toys.
8. Inappropriate materials.

The instructional strategies have been derived from results of recent research literature. This paper is directed to teachers and parents of those severely handicapped children who exhibit these problem behaviors.

Refusal to Play

Problem 1: The child refuses to interact appropriately with toys during free play periods.

In many profoundly retarded and autistic children, the presence of toys elicits little or no response except for continued high rates of physical or verbal self-stimulation. This type of problem prohibits constructive free play actions on different toys and necessitates immediate intervention.

The three strategies listed below may be employed in overcoming the refusal to play problem.

Strategy 1: It may be helpful, initially, to increase the number of toys in the area. Also, the total play area should be reduced in size and enclosed. If the child interacts with any of the toys appropriately, then immediate attention and praise should be provided. In some situations, proximity to materials (Wehman, 1978b), and number of materials (Quilitch & Delongchamps, 1974; Reid, Willis, Jarman & Brown, 1978) will facilitate action on toys. The teacher should intervene with the child who continually spins and turns an object in a purposeless fashion. A different toy can then be placed near the child.

Strategy 2: In other cases, demonstrating the use of different toys directly in front of the child will provide a sufficient stimulus for the child to copy the teacher's behavior. Therefore, before moving to direct manual guidance, a verbal direction plus demonstration should be provided (Morris & Dolker, 1974; Wehman, Karan & Rettie, 1976; Williams, Hamre-Nietupski, Pumplan, McDaniel-Marx & Wheeler, 1978).

Strategy 3: In the majority of cases, however, the above strategies will not prove totally effective, and physical prompting and guidance will be required. Once several play materials have been selected, a task analysis of the target skill(s) should be developed. Each skill should then be task analyzed

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(Williams, 1975; Wehman, 1978c). In order to teach these skills, a *backward chaining* method of instruction may be helpful. With this strategy, the teacher gets on the floor next to the child, places his/her hands around the child's hands on the toys and physically guides the child through the skill until the final step in the sequence. At this point, the child will be encouraged to complete the action. Praise should usually be provided for each correct response.

As the child becomes increasingly proficient in the sequence, the amount of teacher assistance may be gradually reduced. Backward chaining techniques can then be employed with a second and eventually third toy. Research supports the effectiveness of manual guidance of appropriate toy play in decreasing self-stimulation in autistic (Koegel, Firestone, Kramme & Dunlap, 1974) and profoundly retarded individuals (Favell 1973; Wehman, et al, 1976; Kissel & Whitman, 1977).

Although this type of behavior shaping procedure is not considered play by many researchers (e.g., Piaget 1962; Piers, 1972), the development of appropriate motor actions with play objects appears to be a necessary prerequisite to more sophisticated types of exploratory behavior.

Inappropriate Play

Problem 2: When presented with several toys the child repeatedly beats them in a nonfunctional, nonconstructive way.

Differentiating between what is "appropriate" and "inappropriate" play has not always been an easy task for researchers or teachers. Because the very nature of toy play may involve creative actions (Goetz & Baer, 1973), it often is difficult to code right from wrong. One possible solution to this problem is to classify toy play responses as negative and non-negative, with negative being defined as physically harmful or destructive actions directed on the toys or toward peers. On the other hand constant banging of a top on the floor, although not necessarily destructive is certainly not appropriate. This response measurement problem is one which must be solved by the teacher. Perhaps the most efficient means is to record the child's specific actions with the toys. From these observations, objective judgements can be made as to what response is appropriate for a given child.

Once a teacher sorts through these difficulties of coding different play responses, there are several strategies which may be attempted to improve toy interaction skills. These are listed below:

Strategy 1: One possible reason for inappropriate play is that the child may be bored with the same toys or the toys are broken, thus inhibiting appropriate play actions. Therefore, teachers might select toys which are novel (new) to the child, demonstrate how to use them, and then let the child practice using them under supervision.

Strategy 2: Demonstrate correct use of the toy in front of the child. Interrupt inappropriate responses immediately and model a constructive way to use the toy. If the child performs the correct actions provide reinforcement immediately. If not, provide corrective feedback to the child: "No Bob, don't bang the top, spin it like this . . ."

Strategy 3: In situations where the child is continually acting inappropriately with the toys, an assessment must be made of how many of the toys are being played with inappropriately. If most of the materials are being "abused" then it will be necessary to limit the number of toys in the area and teach the child appropriate actions through physical prompting and manual guidance. The backward chaining strategy may be applied with this problem as well.

Lack of Sustained Play

Problem 3: When presented with several toys, the child plays with each for only a few seconds and then withdraws.

This is a common behavior sequence exhibited by many severely and profoundly handicapped children. Lack of sustained toy use is usually a problem which can be remediated through more frequent and structured reinforcement of appropriate play.

Consider the following illustration. Robert is presented with a play work bench and hammer. One set of appropriate responses might be to hammer three different shape pegs. Earlier observations indicate that Robert has these responses in his repertoire but he does not usually emit them. One possible teaching strategy for this problem would be to:

a) Identify an effective reinforcer for Robert;
b) Identify how long Robert must play before receiving reinforcement;

c) Establish a continuous schedule where Robert receives the reinforcement for meeting the time criterion;
d) Gradually increase the time criterion as Robert plays for longer periods;
e) Introduce either a second response with the toy or a new response with a different toy.

Limited Range in Use of Play Materials

Problem 4: When presented with a variety of toys on different days the child always plays with the same one or two toys.

Many severely handicapped children will only interact with the same toy. Unfortunately, this may lead to satiation with the toy and restrict the range of fine motor actions which develop.

Strategy 1: Briefly remove the preferred toys and encourage use of other materials. If the child acts on other toys, then for a short period of time (2 minutes) allow use of a preferred toy. This strategy, also known as the Premack Principle, may strengthen weak play activity.

Strategy 2: Identify toys which have similar stimulus characteristics to the favored toys. After removing the preferred toys, introduce similar materials into the area. Similar stimulus characteristics may include color, shape, size, same cause-effect relationship, and same type of motor skill required to operate toy.

Strategy 3: If these strategies do not work, then it may be necessary to provide totally new toys and demonstrate the reinforcing attributes of these toys. The favored toys should be completely removed from the play area during this instructional time.

Isolate Play

Problem 5: When presented with several toys in the company of one or more peers, the child plays in isolation.

Isolate play is a normal stage of play in child development (Parten, 1932; Barnes, 1971). However, when it persists over several years, to the total exclusion of other children, it becomes a problem. There are times, of course, when it may clearly be appropriate for the child to play alone, particularly when creating materials (Rubin, Maioni, & Hornung, 1976); frequently, however, continued social withdrawal during play time is viewed as abnormal and is unacceptable.

There are numerous strategies which can be employed to overcome this problem. They range from material selection to ways of arranging instructional environment.

Strategy 1: By teaching table games (Marchant & Wehman, in press; Wehman, Renzaglia, Berry, Schutz, & Karan, 1978), and using materials which require interaction by two or more individuals (Quilitch & Risley, 1973), isolate play can be reduced and social play encouraged. Before implementing different teaching methods, the types of materials available should be evaluated.

Strategy 2: A severely handicapped child can be integrated with two or more nonhandicapped peers (Knapczyk & Peterson, 1977; Williams, et al, 1978). The optimal ratio of nonhandicapped to handicapped children is not clear (Strain, Cooke, & Apolloni, 1976). However, mixing several nonhandicapped children with a handicapped child may be effective. There is one caution with this or any strategy requiring modeling; be sure the child has developed imitation skills. If not, it may be presumptuous to assume the child will copy appropriate responses.

Strategy 3: A child can be paired with a less handicapped, although still retarded, peer who engages in appropriate play (Morris & Dolker, 1974). Similarly, "confederate" peers may be integrated into the play session and trained by the teacher to initiate social interactions with the child. (Strain, Shores, & Timm, 1977).

Strategy 4: Two equivalent (low functioning) peers can be paired and trained by one or more adults (Wehman et al, 1976). This situation may prove to be difficult if one child is extremely active, runs away, or has a very short attention span. If not, this is still a more natural training mode because it allows the teacher to "fade" out while the children play together. (Whatman, Mecurio, & Caponigri, 1970).

Strategy 5: A child can be paired with an adult. With more difficult children, the teacher can provide 1 to 1 instruction to the child in taking turns (Wehman & Marchant, 1978). Gradually other children can be "faded" in to the play period.

Refusal to Initiate Social Interaction

Problem 6: When playing with a group of peers, the child fails to initiate social interactions with a peer.

Many young children are withdrawn and reluctant to actively enter into social play, (Strain, et al, 1976); this problem is not limited to severely and profoundly handicapped children. Unfortunately, this is a critical shortcoming in play skills and leads the child to becoming dependent on others to respond first.

There are few documented efforts which describe successful interventions for improving self-directed behavior, let alone *self-initiated* social interactions. (See Williams, et al, 1978 for excellent suggestions). However, there are several techniques which may be attempted.

Strategy 1: In a similiar fashion as before, it may be helpful to set up task interdependent situations (Hake & Vukelich, 1972; Mithaug & Wolfe, 1976). That is, the reciprocally reinforcing consequences which occur in leisure activities such as table games set a natural cue for prompting the child to take turns and initiate an interaction.

Strategy 2: If strategy 1 does not work, it may be necessary for the teacher to play with the withdrawn child and verbally prompt that child to initiate an interaction (Beveridge, Spencer, & Mittler, 1978). It will be helpful in these situations to set up social interactions which are easy for the child and that can already be performed. An example of this might be the teacher saying, "Roberta, take the ball over to Larry." Pointing or gesturing to Larry may be necessary. When the child completes the interaction, reinforcement must be provided immediately.

Strategy 3: Sociodramatic activity and role-playing appropriate social play can be utilized as another means of effectively modeling social interaction (Dommnie, Note 1; Strain, 1975). By having the teacher model the way "good" children play, severely handicapped students with adequate attending and imitative skills may be able to copy this behavior if a play session immediately follows.

Throwing of Toy

Problem 7: When presented with several toys, the child engages in a high frequency of toy throwing behavior.

Unlike the other problems described, this is an excessive motor behavior and not a play skill deficit. Although this is not a common problem, it can be highly frustrating to teachers attempting to improve the qualitative nature of a child's toy play.

Strategy 1: The initial management strategy should be one of interrupting the inappropriate response and looking to reinforce another child. Stopping the throwing response is necessary to avoid possible hazard to other children. For example:

1) Larry begins to throw the toy piano across the room;
2) Teacher interrupts this response and puts Larry on sideline;
3) Teacher goes to Ronnie and says, "Ronnie, I like the way you're playing so nicely!"
4) After a predetermined time passes, the teacher invites Larry back into the play area.

This combination of interrupting the throwing response plus differential reinforcement is highly potent provided it is applied consistently (Porterfield, Herbert-Jackson & Risley, 1976).

Strategy 2: Assuming the problem persists and high rates of throwing continue, the type of play materials available should be manipulated. It will be considerably more difficult to throw heavy objects or objects which are difficult to grasp. This, of course, assumes that the child is young.

Strategy 3: A third possibility which can be attempted is the use of a combination verbal reprimand and differential reinforcement for playing appropriately. Although research literature is mixed on the efficacy of reprimands (Madsen, Becker, Thomas, Koser, & Plager, 1968; Schutz, Wehman, Renzaglia, & Karan, 1978), there is some evidence that they can be effective, especially if reinforcement is employed as well. This strategy has the danger, however, of strengthening the throwing response, thereby serving as a positive reinforcer instead of punisher.

Strategy 4: If none of these methods are effective, a brief 30-second removal from the play area may be necessary, contingent on the throwing response. Time-out from a reinforcing play area may be an effective means of suppressing the inappropriate play response.

The issue of having the child pick up the toy after it has been thrown is one which is undoubtedly of concern to most teachers, and it may be the correct thing to do no matter what

management strategy is employed. Caution should be taken, however. After all, is it really important who wins the battle of picking up the toy and possibly prolonging a confrontation? Or is it better to ignore and then get on with playing with the rest of the toys? This is a difficult decision where the teacher must use careful judgement.

Lack of Appropriate Materials

Problem 8: When provided with toys and games, the child is unable to play because of difficulties with the materials.

Since many severely handicapped children have physical or perceptual problems which inhibit them from using commercially made play materials (Wehman, 1976), it is usually necessary to design or adapt materials (Marchant, 1978). Teachers have the option of either securing the play materials and adapting them to meet the needs of the students or designing and making toys. As with eating and other self-help devices, the teacher must remember that adapted play materials should be used only when it is absolutely necessary because of the tendency for children to become dependent upon such adaptations. As this is an important area in leisure skill programming, a number of strategies are discussed which go beyond toy play alone such as table games.

Students with poorly developed fine motor skills require toys, game cards or playing pieces built up by being placed on heavy cardboard. Such adaptation will make them easier to grasp. For these students, it may be necessary to tape play materials down or use a piece of dyacem to hold materials in place. For example, if pictures on a game board are too close together, it will be helpful to cut out the pictures and separate them on a larger board so the pieces are easier to place. Positioning a student in a prone position over a wedge, i.e., during occupational therapy, instead of at a table may facilitate manipulation of playing pieces or accessibility to toys, especially if the child needs better extension of the upper extremeties.

For a child with perceptual problems, many game boards are too cluttered with fancy designs. It may be difficult to determine where the track begins or ends. Figure-ground difficulties can be reduced by covering all unnecessary designs on the board with solid colored contact paper and by using prompts such as big stars to indicate where to begin and arrows to point to the correct pathway. Prompts can then be faded as game skills are acquired.

The above examples are ways the materials themselves might be adapted. In addition to adapting materials, it may also be necessary to adapt the rules of commercial games to meet the needs of disabled persons. This may be done by reducing the length or complexity of a commercial game to meet the individual needs of students with whom the games will be used. Rules may also be adapted to permit nonverbal students to use manual language or to point out their reply on an answer sheet.

Endless adaptations of games are possible for the determined teacher, but in some instances no commercial games are available or can be adapted to be used for a particular objective. Teacher-made games can fill this void if care is taken in planning and making them.

Games designed for individual children, should be made with large pictures which are uncluttered and should usually contain only one item. Items in the game should be spaced appropriately for the students with whom the game will be used. Game materials should be colorful when possible and be made of durable materials. Lamination, clear contact paper, or dry mounting should be used on the games, particularly if the student has drooling problems. Colorful tape borders should be put around boards to discourage students from pulling off the coverings and rubber cement rather than glue is suggested as an adhesive for paper pictures to insure proper placement and sticking. When carefully made, the laminated or covered games can be wiped clean and used for several years.

Playing pieces should be large enough to be easily grasped and released by the students. Blocks or other small toys can be utilized as can poker chips if the students can handle these easily.

Conclusion

In this paper, an effort has been made to identify typical play problems of severely handicapped children, and suggest several instructional strategies which may be employed to overcome these difficulties. As teachers and parents struggle with the complex problems exhibited by children with severe behavioral handicaps, the development and maintenance of appropriate social and leisure skills is one instructional area which requires greater attention. (Hamre-Nietupski & Williams 1977; Wehman

1978d). In order to prevent institutionalization and facilitate acceptance of the child by other family members and neighborhood children, instructional strategies such as those described in this paper should be implemented. Finally, it should be recognized that these are only suggestions. Every child is unique and has a different learning history making it difficult to prescribe solutions to all problems.

References

Barnes, L. Preschool play norms; a replication. Developmental Psychology 1951, 5, 99-103.

Beveridge, M., Spencer, J., & Mittler, P. Language and social behavior in severely educationally subnormal children. British Journal of Social and Clinical Psychology, 1978, 17(1), 75-83.

Burney, J., Russell, B., & Shores, R. Developing social responses in two profoundly retarded children. AAESPH Review, 1977, 2(2), 53-63.

Favell, J. Reduction of stereotypes by reinforcement of toy play. Mental Retardation, 1973, II, 21-23.

Favell, J. & Cannon, P. Evaluation of entertainment materials for severely retarded persons. American Journal of Mental Deficiency, 1977, 81(4) 357-361.

Friedlander, B., Kamin, P. & Hesse, G. Operant therapy for prehension disabilities in moderately and severely retarded young children. Training School Bulletin, 1974, 71, 101-108.

Goetz, E., & Baer, D. Social control of form diversity and the emergence of new forms in children's blockbuilding. Journal of Applied Behavior Analysis, 1973, 6, 209-217.

Gozali, J. & Charney, B. Agenda for the '70's: full social integration of the retarded. Mental Retardation, 1972, 20, 20-21.

Hake, D., & Vukelich, R. A classification and review of cooperation procedures. Journal of Experimental Analysis of Behavior, 1972, 18, 333-343.

Hamre-Nietupski, S., & Williams, W. W. Implementation of selected sex education and social skills programs with severely handicapped students. Education and Training of the Mentally Retarded, 1977, 12, 364-372.

Kissel, R. & Whitman, T. L. An examination of the direct and generalized effects of a play training and overcorrection procedure upon the self-stimulatory behavior of a profoundly retarded boy. AAESPH Review, 1977, 3, 131-146.

Knapczyk, D., & Peterson, N.S. Social play interaction of retarded children in an integrated classroom environment. Research and the Retarded, 1977, 3, 104-112.

Koegel, R., Firestone, P., Kramme, K., & Dunlap, A. Increasing spontaneous play by suppressing self-stimulation in autistic children. Journal of Applied Behavior Analysis. 1974, 7(4), 521-528.

Madsen, D., Becker, W., Thomas, D., Koser, D., & Plager, E. An analysis of the reinforcing function of "sit down" commands. In R.K. Parker (ed.), Readings in Educational Psychology, Boston: Allyn & Bacon, 1970.

Marchant, J. Teaching hobbies and games. In P. Wehman (ed). Recreation Programming for Developmentally Disabled Persons. Baltimore: University Park Press, 1978.

Marchant, J., & Wehman, P. Teaching table games to severely retarded children. Mental Retardation, in press.

Mithaug, D., & Wolfe, M. Employing task arrangements and verbal contingencies to promote verbalizations between retarded children. Journal of Applied Behavior Analysis, 1976, 9, 201-314.

Morris, R., & Dolken, M. Developing cooperative play in socially withdrawn retarded children. Mental Retardation, 1974, 12, 24-27.

Parten, M. Social play among school children. Journal of Abnormal Psychology, 1932, 28, 136-147.

Piaget, J. Play, Dreams, and Imitation in Childhood. New York: W.W. Norton, 1962.

Piers, M. Play and Development: A Symposium. New York: W.W. Norton, 1972.

Porterfield, J. Herbert-Jackson, E., & Risley, T. Contigent observation: an effective and acceptable procedure for reducing disruptive behavior of young children in a group setting. Journal of Applied Behavior Analysis, 1976, 9(1). 55-64.

Quilitch, H., & Risley, T. The effects of play materials on social play. Journal of Applied Behavior Analysis, 1973, 6, 573-578.

Quilitch, H., & Delongchamps, G.D. Increasing recreational participation of institutional neuro-psychiatric residents. Therapeutic Recreation Journal, 1974, 8, 56-57.

Reid, D., Willis, B. S., Jarman, P., & Brown, K. Increasing leisure activity of physically disabled retarded persons through modifying resource availability. AAESPH Review, 1978, 3(2), 78-93.

Rubin, K., Maioni, T., & Hornung, M. Free play behaviors in middle and lower-class preschoolers: Parten and Piaget revised. Child Development, 1976, 47, 414-419.

Schutz, R., Wehman, P., Renzaglia, A., & Karan, O. Efficacy of contingent social disapproval on inappropriate verbalizations of two severely retarded males. Behavior Therapy, 1978.

Stanfield, J. Graduation: What happens to the retarded child when he grows up? Exceptional Children, 1973, 39, 1-11.

Strain, P. S. Increasing social play of severely retarded preschoolers through socio-dramatic activities. Mental Retardation, 1975, 13, 7-9.

Strain. P. S., Cooke, T. & Apolloni, T. Teaching Exceptional Children Assessing and Modifying Social Behavior. New York: Academic Press, 1978.

Uzgiris, I., & Hunt, J. Assessment in Infancy. Urbana, Ill.: University of Illinois Press, 1975.

Wehman, P. Selection of play materials for the severely handicapped: a continuing dilemma. Education and Training of the Mentally Retarded, 1976, 11(1), 46-51.

Wehman, P. Helping the Mentally Retarded Acquire Play Skills: A Behavioral Approach. Springfield, Ill: Thomas, 1977.

Wehman, P. (ed.) Recreation Programming for Developmentally Disabled Persons. Baltimore: University Park Press, 1978(a)

Wehman, P. Teaching recreational skills to severely and profoundly handicapped persons. In E. Edgar & R. York (eds.), Teaching the Severely Handicapped. Seattle: AAESPH Review, 1978. Vol. IV. (c).

Wehman, P. Effects of different environmental conditions on leisure activity of the severely and profoundly handicapped. Journal of Special Education, 1978, 12(2), 183-193. (b)

Wehman, P. Leisure skill programming for severely and profoundly handicapped persons: state of the art. British Journal of Social and Clinical Psychology, 1978, 17(4). (d)

Wehman, P. & Marchant, J. Improving free play skills of severely retarded children. American Journal of Occupational Therapy. 1978, 32(2) 100-104.

Wehman, P., Renzaglia, A., Berry, G., Schutz, R., & Karan, O. Developing a leisure skill repertoire in severely and profoundly handicapped persons. AAESPH Review, 1978, 3(3).

Wehman, P., Karan, O.C., & Rettie, C. Developing independent play in three severely retarded women. Psychological Reports, 1976, 39, 995-998.

Whitman, T., Mercurio, J., & Caponigri, V. Development of social responses in two severely retarded children. Journal of Applied Behavior Analysis, 1970, 3, 133-138.

Williams, W. W. Procedures of task analysis as related to developing instructional programs for the severely handicapped. In L. Brown, T. Crowner, W. Williams, & R. York (eds). Madison's alternative for zero exclusion: a book of readings. Madison, Wisc.: Univ. of Wisconsin, 1975.

Williams, W. W., Hamre-Nietupski, S., Pumplan, I., McDaniel-Marx, J., & Wheeler, J. Teaching social skills. In M. Snell (ed.). Systematic Instruction of the Moderately and Severely Handicapped. Columbus: Charles Merrill, 1978.

Reference Note:

Note 1. Domnie, M. Teaching severely handicapped children to enact an imaginary event. Unpublished manuscript. Madison Wisc.: Madison Public Schools, 1974.

Level I - Toy Play

Exploratory Play
1. Acts on toy or play objects
2. **Representative Activities:** Reaches for objects; bats at objects; grasps and squeezes toys; makes regular oral contact with toys; shakes objects; throws toys; engages in high rate self-stimulatory actions with toys

Independent Play
1. Plays appropriately alone on wide range of materials
2. **Representative Activities:** Uses playground equipment. Uses following toys: blocks, puzzles, dolls, stacking rings, top, snap beads, play phone, pull toys, ball, musical instruments, tricycle, Lincoln Logs, books, water colors, hula hoop

Parallel Play
1. Plays independently on wide range of materials in close proximity to others
2. **Representative Activities:** Swings on swing next to peer; Builds block tower near peer; Bounces ball near peers; Colors at table with peers

Associate Play
1. Initiates interaction with peers in play situations for short periods of time
2. **Representative Activities:** Approaches peer with a toy; Makes brief physical contact with peer during play; Makes regular eye contact with peer during play

Cooperative Play
1. Exhibits mutual participation and peer interaction during play
2. **Representative Activities:** Ball rolling; building blocks; pulling a peer in a wagon; use of toy phone; pushing a peer on a swing or down a slide; taking turns hitting Bop Bag

Symbolic Play
1. Engages in dramatization and imaginative/pretend play
2. **Representative Activities:** Domestic make-believe play with dolls, cars, trucks, blocks, house, and dishes; Dress-up activities; Use of puppets; paper dolls; Playing cowboys/Indians, doctor/nurse, cops/robbers

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Level II - Passive Leisure

Simple Attending
1. Pays attention to visual or auditory presentations
2. **Representative Activities:** Looks at pictures in books; Listens to musical instruments; Listens to radio; Listens to record player; Listens attentively to stories; Watches television

Complex Attending
1. Passive activities which require greater cognitive/intellectual ability
2. **Representative Activities:** Engages in crossword puzzles; Engages in cooking outside; Engages in observing nature; Engages in use of CB radio; Engages in letter writing; Follows news/sports events

Spectator Activities
1. Travels to places and events in community for leisure
2. **Representative Activities:** Attends movies; Attends music concerts; Attends carnivals and fairs; Attends dance shows; Attends circus; Attends animal shows; Attends library; Attends church

Educational Activities
1. Becomes involved in fulfilling requirements of specific instructional courses
2. **Representative Activities:** Takes non-credit Adult Education classes; Takes art and music lessons; Takes GED test; Takes vocational-technical courses at local junior college

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From P. Wehman (ed). Recreation Programming for Developmentally Disabled Persons. Baltimore: University Park Press, 1979. Page 6-7. Reprinted by permission.

Level III - Game Activities

Simple Imitative Group Games
Peek-a-Boo; This Little Piggy; Where is Thumbkin; Ring-Around-Rosy; Duck-Duck-Goose; I Spy; Simon Says; Follow the Leader; London Bridges; Tisket-Tasket

Complex Group Activities
Relays; Tag; Hide-and-Seek; Hopscotch; Snake-in-the-Gutter, Rhythm games: Twenty Questions; Memory games: Charades; Counting Games: Car traveling games

Simple Table Games Representative Games
Candyland; Funny Face; Hi-Ho-Cherry-O; Pig-in-a Garden; Goldilocks and the Three Bears; Lotto; Gnip-Gnop; Tic-Tac-Toe

Card Games
(matching and recognition games) Old Maid; Snoopy; Snap; Go Fish; Authors; Hearts; Rummy; Set Back; Concentration; War; Crazy Eights; Poker; Solitaire; Pre-academic learning games

Complex Table Games Representative Games
Checkers; Clue; Man From Uncle; Monopoly; TV Game Show Games; Easy Money; Dominoes; Scrabble; Chinese Checkers; Go to the Head of the Class

Table Games Sports Representative Games
Foosball; Table Hockey; Electric Bowling; Air Hockey; Pinball Machines; Bumper Pool; Electric Screen Games

Level IV - Hobby Activities

Simple Hobbies
1. Requires limited fine motor skill
2. **Representative Activities:** Fingerpainting; Cuts with scissor; Colors with crayons; Pastes; Makes simple potholders; Cares for plants and flowers; Makes simple candle and vase arrangements

Scrapbook and Collections
1. Requires sustained interest in given collection of materials
2. **Representative Activities:** Coin Collection; Beer Can Collection; Photograph Album; Models and Dolls; Stamps; Care for a Pet; Picture Diary; Sports Scrapbook.

Arts and Crafts Activities
1. Requires more advanced fine motor skills and instruction-following skills
2. **Representative Activities:** Baking; Decorating; Needlepoint; Knitting; Making Dolls and Model Airplanes; Mosaics; Furniture Building and Refinishing; Woodcarving; Clay Work; Sculpture; Leather Crafts

Life Science Activities
1. Requires understanding of basic concepts in science
2. **Representative Activities:** Becomes involved in horticulture activities; Raises and breeds pets; Follows stars, planets, and other phenomena in universe; Visits community facilities such as planetarium and aquarium

Level V - Sports

Individual Motor Activities
1. Requires limited gross motor skill; ambulatory or nonambulatory
2. **Representative Activities::** Rolling on mat; Sitting on swing; Scooting; Crawling; Walking; Jumping on Trampoline; Climbing; Running; Hopping; Throwing

Group Motor Activities
1. Requires limited gross motor skill; must have ability to cooperate in group of two or more
2. **Representative Activities:** Simple ball play; Group barrel rolling; Wheelchair relays; Follow-the-Leader; Use of Teeter-Tooter equipment; Beanbag throw

Noncompetitive Sports
1. **Representative Activities:** Boating; Sailing; Canoeing; Dancing; Camping; Hunting; Motorcycling; Biking; Tree Climbing; Skiing; Sledding

Individual Competitive Sports

1. Requires basic understanding of the concept of win/lose
2. **Representative Activities:** Croquet; Jogging; Weightlifting; Swimming; Horseshoes; Pool; Ping Pong; Wrestling; Skating; Tennis; Badmitton; Handball; Gymnastics

Team Competitive Sports

1. Requires basic understanding of win/lose concept and ability to work with a team
2. **Representative Activities:** Football; Basketball; Baseball; Soccer; Softball; Field Hockey; Volleyball

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Level VI - Socialization

Restricted Socialization

1. Requires ability to interact appropriately
2. **Representative Activities:** Ability to initiate friendships; Having a "close" friend; Visiting relatives; Ability to attend social functions under supervision

Community Socialization

1. Requires ability to interact appropriately; also, must be able to travel with minimal supervision
2. **Representative Activities:** Joins clubs such as Boy Scouts and sports clubs; Becomes involved in community groups and activities such as United Way and works with non-handicapped peers; Takes short courses, music lessons, etc.

Sexual Expression

1. Requires understanding of basic concepts in sex education
2. **Representative Activities:** Attends dances and parties with member of opposite sex; Initiates and/or receives invitations to date; Engages in physical contact with member of opposite sex

Community Contributions

1. Requires ability to interact appropriately, travel independently, and accept responsibility
2. **Representative Activities:** Engages in the following types of volunteer/service work: Babysitting; Companion service; Work for the Red Cross and local hospitals; Soliciting; Political campaigns; Church work

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VOCATIONAL TRAINING OF THE SEVERELY RETARDED: EXPECTATIONS AND POTENTIAL

Handout 8

Paul Wehman, Ph.D.

Currently, there is a growing emphasis on vocational training programs for severely retarded adolescents and adults. State and federal agencies are allocating large sums of money for vocational rehabilitation programs that serve the severely impaired. This is, to a large extent, a result of recent legislation providing for increased efforts at vocational rehabilitation of the severely retarded *(Rehabilitation Act of 1973——P.L. 93-112)*. With the push to rehabilitate many clients once thought beyond the scope of most rehabilitation agencies has come the dilemma of what to expect from these clients. It is difficult to evaluate programs and establish accountability with the lack of awareness of what severely retarded clients can do and what potential they have for habilitation into society.

It is a common belief of professionals in many rehabilitation settings that severely retarded people are able to perform only the simplest of tasks. In recent years, however, significant progress has been made in the behavior technology of vocational training for the severely and profoundly retarded. The purpose of the present article is to familiarize rehabilitation administrators, counselors, and workshop supervisors with the behavioral expectations and vocational potential associated with severely retarded persons. A secondary purpose is to discuss briefly implications for preparing rehabilitation counselors to cope effectively with severely retarded clients needing vocational rehabilitation.

Behavioral Characteristics of the Severely Retarded

There is considerable variability between individual learning and behavioral characteristics of severely retarded persons (IQ 21-35). Most severely retarded people have behavior deficits or insufficient self-management skills to function without supervision. However, some severely handicapped persons also display behavior excesses such as extreme episodes of aggression or self-abusive behavior. Frequently, a combination of behavior deficits and excesses may be present as well.

While it is difficult to draw a reliable behavioral profile of the severely retarded, certain statements are indicative of their adaptive behavior. Severely retarded clients usually have basic self-help skills but may not have developed fine motor skills such as buttoning or zipping. Also, there are usually deficits in attending skills and in imitation learning. Language is generally restricted to simple receptive communication with few expressive verbalizations that are understandable. Cognitive skills such as problem-solving, concept formation, and dealing with abstracts are usually minimal. Cooperative social interaction between peers is rarely present. Also, severely retarded persons do not make generalizations as easily or rapidly as do intellectually average individuals.

Severely retarded clients may exhibit behavior excesses in the form of self-stimulatory body-rocking, head-weaving, or self-abusive head-banging. They frequently display bizarre verbal behavior through strange sounds or grunts. Excessive outbursts of physical aggression may develop in response to frustrating social situations or demanding work task requirements.

In short, severely retarded persons represent different and challenging cases for rehabilitation agencies and workshops. Traditional psychotherapeutic counseling and training methods that require verbal counseling are usually not effective with these clients and must give way to a behavioral approach.

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Work Skill Expectations

Increasing research evidence is available to suggest that severely retarded clients can be effective workers on complex manual tasks.[6,13] Several researchers have investigated the viability of presenting severely retarded workers with complex tasks such as putting together a drill machine[3] or bicycle brakes.[7] In the Crosson[3] report, a 16-step task analysis was utilized to teach severely retarded adolescents how to put together a drill machine. In a task analysis approach, a behavior is divided into smaller increments and presented in a logical sequential chain. Difficult learning discriminations are made easier as positive reinforcement is delivered for successful responses. Brown and his associates[1,2] have also used a task analysis approach successfully in studying the effects that different reinforcement contingencies have on rate of production with moderately and severely retarded adolescents.

Gold provides a series of research studies demonstrating the effectiveness of moderately to severely retarded clients on complex work tasks.[6] Through the use of errorless learning, or easy-to-hard discriminations, moderately to severely retarded adults were trained to put together a 15-piece bicycle brake.[5] In the same report, subjects demonstrated successful transfer of training by putting together a 24-piece bicycle brake. A one-year follow-up study indicated significant retention effects by clients.

Through use of an easy-to-hard method of errorless learning, it was also shown that moderately to severely retarded clients were able to make discriminations between different bolt lengths as fine as one-eighth of an inch.[8] Gold[5] also reports the successful performance of 20 moderate to severely retarded clients in putting together a 14-piece coaster brake. An important finding of this study was the nonsignificant statistical relationship between IQ and production rates of clients participating in the program. This is in direct conflict with earlier reports that supported the notion of higher IQs being related to greater production rates in severely retarded clients.[15]

Tate and Baroff[14] describe a demonstration workshop project in which severely retarded persons put together a 20-piece assembly design of a relay panel. Clients were expected to make wire connections and solder them. After one year in operation, the shop was operated 6 hours a day, Monday through Friday, with 26 clients employed. Several reports demonstrate the use of token reinforcement systems to increase production rates of severely retarded clients.[10, 12]

Social Behavior in Vocational Settings

The issue of work skill expectations has been discussed through a brief review of relevant research literature. However, efficient work production is only part of successful vocational adjustment. Appropriate social behavior is required to integrate the client into the mainstream of the labor force. Few published reports have been directed at the adaptive social behavior of severely retarded individuals in vocational settings.

Edmonson, Leland, and Leach [4] have developed a Test of Social Inference for educable mentally retarded adolescents. Pictures of different social situations are used to assess inferences and comprehension of clients. Social-perceptual training materials are also available to assist clients in social cue recognition and interpretation. Filmstrips and tape recorders are used to present materials to clients. The basic content includes pictorial representations of persons engaging in different adaptive behavior necessary for successful vocational and community adjustment. Classroom curricula of various topical areas in social skills development are utilized as a supplement to the audio-visual aids.

There are several drawbacks to the Social Inference Curriculum presented by Edmonson and her colleagues. First, methods of measuring change are not behavioral, but rather computed on paper-and-pencil tests through teacher ratings on such scales as those of Social Range, Social Invisibility, and Social Relationship. Secondly, the curriculum, which purports to be for prevocational training, is extremely broad in scope and lacks the specificity required for programming. Thirdly, the curriculum does not appear to be sensitive to the unique needs of a severely retarded population.

Goldstein[9] presents an extensive social learning curriculum for the mentally retarded, also. The broadly defined objectives of this curriculum are to help mentally retarded people develop social skills necessary for successful adjustment in the community. This curriculum also fails to provide specific

behaviors for training, and the logic of sequencing is suspect. It appears to be more theoretical in orientation and tends to rely on hypothetical constructs such as self-concept and self-awareness.

Recently, a social skills curriculum was proposed specifically for developmentally disabled clients in vocational settings by the writer.[17] The curriculum is divided into four levels: Personal Care Level, Primary Interaction Level, Job and Community Survival Level, and Advanced Interaction Level. A major strength of this curriculum is the sensitivity to all functioning levels of mentally retarded persons. Furthermore, goals within the curriculum are stated behaviorally and are directly related to requisite social behaviors required in most work settings. Most of the behavioral goals at the different curriculum levels are empirically supported through previous research. Examples of some of the specific behavioral goals across different levels of the curriculum include: proper selection of clothing, proper table manners, good posture, eye contact during interaction, proper social greetings, knowledge of time, use of phone, knowledge of whom to trust, and demonstration of cooperative behavior.

Components of an Effective Vocational Training Program for the Severely Retarded

An analysis of the existing vocational and social skill research with severely retarded clients indicates that there are several integral components present in successful training programs. These elements are briefly outlined and discussed as an aid to workers in rehabilitation settings faced with the vocational training of a severely retarded population.

A task analysis method of presentation is instrumental in making the job easier for the client, thus increasing the probability of success. Breaking a social skill or work task into smaller, logically sequenced increments allows the severely retarded person to absorb the information easier. The smaller increments of behavior are gradually chained together through reinforcement, thus developing the whole skill. It would appear in vocational programming with low-functioning retarded persons that work tasks should be task-analyzed by rehabilitation workers previous to beginning training sessions. Eventually, a program notebook of task analyses can be completed and prescribed for each client.

A high degree of structure in the vocational setting and consistency in approach by trainers in the initial stages of training is required for optimal performance. Instructions used during training must be consistent and there should be little variability in the methods of presentation and the criterion for reinforcement. Initially, the physical environment should be a setting with few distractions.

Reinforcers must be individualized for each client and demonstrate that they are instrumental in increasing behavior. Often it is difficult to discern what reinforcers will influence the behavior of severely retarded persons. The rehabilitation worker must test out different reinforcers and evaluate the effect of each on work performance. Severely retarded workers demonstrate a wide variability in reinforcer preference. Presenting a variety of functional reinforcers initially on a continuous schedule of reinforcement and gradually on a more intermittent schedule will result in acquisition of the desired vocational behaviors.

Vocational programs utilizing carefully gathered data of a client's work performance are most effective in making program modifications and decisions. The severely retarded make behavioral gains slowly, and evaluation of program methods is usually subjective without careful documentation. Previously, the writer has presented a list of several points that are advantageous in using a data-based approach to programming.[17] These are:

1. Gain an accurate pretreatment index of the degree (frequency) of behavior.
2. The behavior must be defined clearly and be discrete and observable.
3. Gradual improvements can be charted and graphed, and thus provide positive feedback to staff and parents.
4. Length of treatment time can be identified precisely, as well as the effects that treatment has on behavior.
5. An objective index of accountability is gained with parents and administration.

Methods to facilitate transfer of training and response maintenance must be planned and developed within the overall program. It cannot be expected to occur spontaneously. As mentioned earlier, severely retarded persons frequently lack imitation and incidental learning skills and do not generalize across settings or tasks readily. A number of methods for enhancing generalization are

available and are discussed in depth by the writer elsewhere.[18] Briefly, however, they include: 1) varying the stimulus conditions of training, 2) including parents and peers in training, 3) gradually fading reinforcement contingencies and substituting naturally occurring reinforcers, 4) training skills that have a high probability of being performed daily by the client and that are meaningful in content, 5) altering reinforcement schedules, and 6) developing self-control techniques.

Toward a Behaviorally Oriented Rehabilitation Counselor

For rehabiiitation counselors to continue to be a formidable force in the vocational rehabilitation of severely retarded clients, several changes in preparatory, as well as inservice, training are necessary. Presently, most rehabilitation counselors are not prepared for the unique behavior deficits and excesses exhibited by many markedly retarded individuals. Previous research strongly indicates that competent work and social skill performance are within the grasp of this population. However, rehabilitation counselors will need to serve more as behavioral engineers and change agents of the environment.

The following suggestions are advanced for development of a behaviorally oriented, rather than psychometric test-oriented, rehabilitation counselor:

1. *Complete understanding and working knowledge of fundamentals and principles of behavior management.* This can be achieved through part-time course work or independent reading. Several good elementary texts are available for beginning reading.[11, 19] Knowledge of basic principles is helpful because it gives the counselor familiarity with the educational technology that has been proven effective with a severely retarded population. Further, it helps the professional disallow incorrect allegations as to the moral and ethical "wrong" of behavior management methods.

2. *A commitment to a data-based system of training and programming.* This requires understanding by the counselor in the formulation of behavior objectives, behavior observation methods, and data presentation techniques. Through a data-based system, research information is generated, thus facilitating greater knowledge about the rehabilitative process with the severely retarded.

3. *Rehabilitation counselor education programs should include an opportunity for practicum experience with severely retarded populations.* Many graduate students working toward an advanced degree in vocational rehabilitation have never encountered severely retarded persons. It should be helpful to sensitize students to the particular rehabilitative and training difficulties presented by this population.

Vocational Outlook for the Severely Retarded: Conclusions

The following conclusions about the vocational training potential of the severely retarded seem warranted:

1. Under appropriately arranged learning conditions, the severely retarded worker has the potential to perform reasonably complex (manual) work tasks.
2. Supervision and training are maximal in the initial training stages, which may be at least three months depending on task complexity, but as the task is acquired supervision can be substantially reduced.
3. A significant problem in programming for the severely retarded in vocational settings is the critical lack of appropriate social behavior. Inability to cope with frustrating events, the presence of bizarre verbal or motor behaviors, and basic social skill deficits all may contribute to rejection of the severely retarded individual as a successful employee.
4. Few programs are available that demonstrate that the severely retarded are capable of competitive employment level production rates; this is an area requiring investigation and one in

which the writer and his colleagues are presently involved.

Although the work skill research reported in this article serves as a demonstration of vocational behavior potential in severely retarded individuals, there are several issues, aside from social skill deficits, that may well prohibit their entry into community work forces. An initial problem is the probable reluctance of employers to take on severely retarded workers. There have been immense job placement problems with the mildly handicapped; certainly, acceptance of the severely retarded, a population with unique behavior characteristics, will be no easier.

Two potential avenues are open for overcoming this difficulty. Use of discrimination lawsuits or related litigation may alter employer behavior, if not attitudes. Secondly, the possibility exists that government subsidies might temporarily be directed to employers who are sympathetic to giving severely handicapped workers a chance to prove themselves.

Another issue that must be addressed by rehabilitation counselors is the preparation of appropriate transitioning experiences from the original training site to the least restritive work environment, that is, a job placement in which the clients can perform at his or her optimal level of independence. Most vocational rehabilitation failures of developmentally disabled persons revolve around placement without proper preparation for the job. Role-playing similar work environments, behavior rehearsal, and gradual on-the-job training are ways of overcoming such failures. Volunteers and university practicum students might be used to assist busy rehabilitation counselors in this transition phase.

A final consideration in the eventual job placement of the severely retarded is the type of task or skill that they can perform. The complex assembly skill research reported herein, although most impressive, is not all that practical. Many communities do not have any industry or need for performance of complex tasks. It may be wisest to train clients to meet the vocational needs of the community. Perusal of local newspaper job openings is one possible method of determining viable skills to train.

The long-range outlook for severely retarded clients is presently at a pivotal point in time. Rehabilitation professionals, with their broad-based training and service with many disabled populations, are in a position to help severely retarded persons adjust to vocational settings. However, vocational rehabilitation counselors must gain familiarity with behavior management techniques and give acceptance to this training technology. With these added skills, counselors can become even more effective in delivering vocational training and services.

List of References

1. Brown, Lou, and others. The Development of Quality, Quantity and Durability in the Work Performance of Retarded Students in a Public School Prevocational Workshop. Training School Bul. Aug., 1972. 69:2:58-69.

2. Brown, Lou, and others. Effects of Consequences on Production Rates of Trainable Retarded and Severely Emotionally Disturbed Students in a Public School Workshop. Education and Training of the Mentally Retarded. Apr., 1972. 7:2:74-81.

3. Crosson, James E. A Technique for Programming Sheltered Workshop Environments for Training Severely Retarded Workers. Am. J. Mental Deficiency. Mar., 1969, 73:5:814-818.

4. Edmonson, Barbara; Leland, Henry; and Leach, Ethel M. Social Inference Training of Retarded Adolescents at the Prevocational Level. Final Report. Kansas City, Kans.: Univ. of Kansas Medical Center, 1967.

5. Gold, Marc W. Factors Affecting Production by the Retarded: Base Rate. Mental Retardation. Dec., 1973. 11:6:41-45.

6. Gold, Marc W. Research on the Vocational Habilitation of the Retarded: The Present, the Future. In: Ellis, Norman R., ed. International Review of Research in Mental Retardation, Vol. 6. New York: Academic Press, 1973.

7. Gold, Marc W. Stimulus Factors in Skill Training of Retarded Adolescents on a Complex Assembly Task: Acquisition, Transfer, and Retention. Am. J. Mental Deficiency. Mar., 1972. 76:5:517-526.

8. Gold, Marc W., and Barclay, Craig R. The Learning of Difficult Visual Discriminations by the Moderately and Severely Retarded. Mental Retardation. Apr., 1973. 11:2: 9-11.

9. Goldstein, H. Construction of a Social Learning Curriculum. Focus on Exceptional Children. 1969. 1:1-10.

10. Karen, Robert L.; Eisner, Melvin; and Endres, Robert W. Behavior Modification in a Sheltered Workshop for Severely Retarded Students. Am. J. Mental Deficiency. Nov., 1974. 79:3:338-347.

11. Reynolds, George S. A primer of Operant Conditioning. Glenview, Ill.: Scott, Foresman, 1968.

12. Screven, C. G.; Straka, Joseph A.; and LaFond, Richard. Applied Behavioral Technology in a Vocational Rehabilitation Setting. Chap. 14, p. 315-359, in: Gardner, William I. Behavior Modification in Mental Retardation. Chicago: Aldine-Atherton, 1971.

13. Schroeder, Stephen R. A Program for Research and Training of Complex Rehabilitative Performance Skills Among the Retarded. Psycholog. Record. Winter, 1972. 22:1:63-70.

14. Tate, Bobby G., and Baroff, George S. Training the Mentally Retarded in the Production of a Complex Product: A Demonstration of Work Potential. Exceptional Children. Feb., 1967. 33:6:405-408.

15. Tobias, Jack, and Gorelick, Jack. Work Characteristics of Retarded Adults at Trainable Levels. Mental Retardation. Dec., 1963. 1:6:338-344.

16. Wehman, Paul H. Guidelines in Managing Noncompliance Behavior in Severely Handicapped Students. Manuscript submitted for publication.

17. Wehman, Paul H. Toward a Social Skills Curriculum for Developmentally Disabled Clients in Vocational Settings. Rehab. Lit. Nov., 1975. 36:11:342-348.

18. Wehman, P.; Abramson, M.; and Norman, C. Transfer of Training in Behavior Modification Programs: An Evaluative Review. J. Spec. Educ., in press.

19. Whaley, Donald L., and Malott, Richard. Elementary Principles of Behavior. Appleton-Century-Crofts, 1971.

Behavioral Training Strategies in Sheltered Workshops for the Severely Developmentally Disabled

Handout 9

Paul Wehman
Adelle Renzaglia
Richard Schutz

This paper is a behavioral analysis of learning and behavior problems which may be expected of severely developmentally disabled persons in vocational settings. The behavioral analysis includes three major sections: (1) a categorization and description of primary problems encountered by a severely handicapped population, (2) a logically arranged hierarchy of behavioral procedures which can be used to treat different types of problems, and (3) a general set of management strategies. It is recommended that the hierarchy of behavioral procedures be empirically validated.

In recent years, applied behavior analysis is one training methodology which has been used successfully in the amelioration of emotional and learning handicaps found in several deviant populations (e.g., Haring & Brown, 1976). Behavioral training techniques have also been effective in training complex assembly skills in moderately, severely, and profoundly retarded adolescents and adults (Bellamy, Peterson, & Close, 1975; Crosson, 1969; Gold, 1972; Hunter & Bellamy, 1976).

Much of the vocational research and programs with the severely developmentally disabled has been directed toward instructional strategies to facilitate the acquisition of complex manual tasks. Basic tenets of discrimination learning (Gold & Scott, 1971; Zeaman & House, 1963) and task analytic skill sequencing have been used when difficult job skills are required (Crosson, 1969).

Although research completed on acquisition of complex tasks, such as assembling cable harnesses, drill presses, or bicycle brakes, has demonstrated that the severely handicapped can learn if material is presented in a logically arranged sequence, relatively few efforts have been directed toward developing innovative techniques and strategies for accelerating work performance. Typically, efforts at increasing production have included some manipulation of reinforcement contingencies (Brown & Pearce, 1970; Schroeder, 1972). However, other behavioral treatment practices have not received attention by researchers in vocational programming for the severely retarded. This paper provides a behavioral analysis of work problems which may be expected of severely developmentally disabled clients, and identifies and discusses a logically arranged sequence of behavioral procedures available to overcome specific vocational problems.

Presenting Problems

Work behavior may be subdivided into learning a skill (acquisition), and then performing it accurately at a high enough rate (production) to meet competitive employment standards. These two processes can be analyzed more closely, however, through a specific description of the client's vocational behavior excesses or deficits.

Acquisition Problem——Discrimination Deficits

A problem typical of severely handicapped workshop clients is failure to attend to the salient cues (size, color, form) of a task. The person ignores relevant variables and instead may try to assemble or sort materials without watching what he or she does or while attending to the wrong cue in the task. As Gold (1973) notes, this is the main obstacle for the mentally retarded in acquiring complex manual skills. Gold (1972) has found that retarded people can master a difficult job at a rate similar to nonretarded peers when they attend to relevant dimensions.

Acquisition can also be impeded by a client's failure to attend to verbal cues of the supervisor. A common characteristic of severely handicapped adults is noncompliance behavior and inability or

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unwillingness to follow simple instructions. Even though a worker may attend to the learning task, his failure to follow instructions can interfere with acquisition rates, particularly if job requirements or materials vary slightly from day to day.

Acquisition Problem——Sensory-Motor Deficits

Many severely developmentally disabled persons receiving vocational programming services also display sensory-motor deficits. For instance, clients with cerebral palsy, loss of limb, and spasticity or athetosis may require prostheses or specially arranged environmental support.

Certain clients may be visually handicapped or hearing impaired, thus prohibiting the use of standard training procedures. The rare combination of both aural and visual handicaps in retarded workers is perhaps the most difficult disability to overcome for the acquisition of complex work skills. Yet some workers have found that such disabilities need not impede learning progress on difficult tasks such as bicycle brake assembly (Gold, 1976).

Low Production——Slow Motor Behavior

Once a vocational task is mastered, high rate performance becomes important. This is a serious problem with many severely and profoundly retarded workers, particularly those with a long history of institutionalization. Slow motor behavior is one characteristic of severely developmentally disabled workers who have not previously been required to meet a work criterion for success. Clients may be persistent and stay on task, but their actual motor movements are lethargic and at far too low a rate to be competitive (Hollis, 1967a, 1967b). Often such clients are unresponsive to the commonly used workshop incentives such as praise or money.

Without objectively established work criteria, it is difficult for workshop supervisors to determine which clients are performing competitively. Workers who stay on task and do not disrupt workshop routine are often viewed as performing adequately. This view is based on a popular vocational training model of "work activity" or "keep busy" rather than a developmental model which looks to expand the client's work skill repertoire.

Low Production——Interfering Behaviors

Equally problematic in accelerating production rates with the severely and profoundly retarded are interfering or competing behaviors, such as high levels of distractability and hyperactivity, out-of-seat behavior, excessive looking around, making bizarre noises, and playing with the task.

Similarly, the work performance of severely developmentally disabled clients may be highly susceptible to changes in the work environment. Fairly commonplace alterations in setting or routine, e.g., furniture rearrangement, can upset work behavior, thus making continuity of programming extremely difficult. A worker may display criterion-level work rates, but only for short periods of time. Interfering or competing behaviors interrupt the work level required for successful community placement.

Specific Training Techniques for Alleviating Work Problems

To meet these various workshop problems with severely developmentally disabled clients a logically arranged sequence of training and behavior management procedures is required. This section provides a hierarchy of techniques and guidelines for alleviating these workshop problems. Workshop staff members may draw on the techniques which are the most effective, the least time consuming, and the most economical. The sequence is affected by traditional methods of alleviating problems within the world of competitive employment. The less severe or more typical training and management procedures are listed as most desirable for use.

For example, giving a verbal reprimand would be preferred (Schutz, Wehman, Renzaglia, & Karan, in press) to using restraint if both procedures were equally effective in alleviating the problem. However, it may be necessary for a trainer to use his or her own discretion with each individual client in determining the most appropriate procedure. If a trainer has had previous experience with a particular client and has found that a verbal reprimand *increases* inappropriate behaviors (e.g.,

Madsen,Becker, Thomas, Koser, & Plager, 1970), it would be beneficial to begin with the next technique in the hierarchy to ensure success.

Table 1 contains a summary of the proposed hierarchy of training and behavior management procedures for ameliorating workshop problems. These are arranged for each problem area.

Acquisition Problem--Discrimination Deficits

The most frequently used training method in competitive employment is verbal instructions. Many times a new task will be presented with only a verbal explanation. Thus, this should logically be the initial method used to train a new task. If unsuccessful, a trainer must attempt to train a task through alternative methods.

Alternatives include verbal instructions paired with modeling of the correct movements (Bellamy et al., 1975; Clarke & Hermelin, 1955), priming the response, and physical guidance (Williams, 1967). Breaking a task down into small measurable components (task analysis) is also effective in aiding acquisition (Crosson, 1969; Gold, 1972), as is presenting learning material in an easy-to-hard sequence (Gold & Barclay, 1973; Irvin, 1976). For clients who fail to attend to relevant cues or task dimensions, cue redundancy, e.g., color-coded parts, facilitates acquisition (Gold, 1974).

Acquisition Problem--Sensory-Motor Deficits

In meeting the needs of clients with sensory-motor deficits, the trainer must first consider the clients' physical capacity. For clients with poor motor coordination due to cerebral palsy or loss of limb, the first four suggested strategies in the hierarchy do not differ from those used with clients whose acquisition problems are due to discrimination deficits. However, if the client's physical limitations are extensive, the arrangement of materials or the use of prosthetic devices such as specially designed jigs may be crucial in the acquisition of vocational skills (Hollis, 1967a). It may be necessary for a trainer to modify the task so that clients can complete a task with the least effort and most speed.

Low Production--Slow Motor Behavior

As clients become more proficient at performing a task, increasing the rate of production to competitive employment standards becomes a focal point. The severely developmentally disabled must produce at a competitive level to obtain and maintain community workshop employment. A verbal prompt to "work faster" appears to be the least time consuming and most efficient technique, providing that it is effective (Bellamy et al., 1975). Peer modeling (Brown & Pearce, 1970; Kazdin, 1973b; Kliebhahn, 1967) and trainer modeling have also increased production rate.

The manipulation of reinforcing events is another extensive area of possible techniques. Increasing reinforcer proximity, increasing the frequency or the amount of reinforcement, and increasing the number of redemptions of token reinforcers in a work period all are logical techniques for increasing production rates (e.g., Schroeder, 1972). Furthermore, our experience indicates that mixed schedules of reinforcement, such as continuous social reinforcement for each unit completed and penny or token reinforcement for every ten units completed, can be extremely effective in altering production rates with the severely handicapped (Wehman, Renzaglia, Schutz, & Karan, 1977). Intermittent schedules of reinforcement are a means of programming for response maintenance and approximating competitive employment work situations.

However, if the problem of low production rates still persists, it may be necessary to provide aversive consequences. Once a trainer has established a minimum criterion for production rate, the use of aversive consequences may be necessary. Implementing a verbal reprimand procedure and no reinforcement (Schutz, et al., in press), or a response cost procedure for low production, may be effective if used in conjunction with positive consequences for acceptable work rates. With an established minimum criterion for performance, an isolation-avoidance procedure may also be used successfully (Zimmerman, Overpeck, Eisenberg, & Garlick, 1969). (An isolation-avoidance procedure entails removing the client from the work area if a designated criterion is not met.)

Because low production is often a result of slow motor behavior, which is characteristic of the severely developmentally disabled, implementing a positive practice overcorrection procedure with the intent of teaching fast motor behavior is a feasible alternative (e.g., Rusch & Close, 1976). This

procedure requires guiding the client through a task a number of times (so that it constitutes an extended duration) quickly, and therefore, teaching a client to move with speed. If positive practice is implemented, a trainer must take care to make the physical guidance sufficiently unpleasant that it is not socially reinforcing.

This procedure was recently applied to a profoundly handicapped adolescent who was performing at a very low production rate (Wehman, Schutz, Renzaglia, & Karan, 1977). When positive reinforcement for meeting criterion work levels was combined with positive practice, the trainee rapidly reached the target rate. In this situation, the client increased the rate of on-task behavior to avoid positive practice training.

Low Production--Interfering Behavior

Low production rate as a result of nonfunctional competing behavior poses a somewhat different problem. A trainer must not only increase a client's work rate, but also decrease or preferably eliminate the amount of time a client engages in the interfering behavior. Manipulating different parameters of reinforcement may also be effective here; unfortunately, little or no published research is available describing efforts to overcome excessive distractability by severely developmentally disabled clients in vocational settings.

To decrease many interfering behaviors, it may be necessary to implement aversive consequences. The use of response cost (Kazdin, 1973a), time-out (Mac-Donough & Forehand, 1973), restraint, and positive practice (Azrin, Gottlieb, Hughart, Wesolowski, & Rahn, 1975; Wehman, Schutz, Renzaglia, and Karan, 1977) procedures as immediate consequences for engaging in interfering behaviors may successfully decrease stereotypic behavior, aggression, out-of-seat behavior, and bizarre noises. These techniques have been effective with handicapped populations in different settings (Gardner, 1969), and should be seriously considered in workshops for the severely developmentally disabled.

General Strategies for Treatment

To facilitate specific sequences of training and management techniques, a number of general strategies for treatment may be employed. The general intervention strategies discussed in this section include changing-criterion methodology, isolated treatment programs, and self-control strategies.

Changing-Criterion Design

A changing-criterion design may be used when work behaviors are gradually shaped to a competitive level (Axelrod, Hall, Weis, & Rohrer, 1974; Bates, Wehman, & Karan, 1977; Hartmann & Hall, 1976; Kazdin, 1975). Employing this design, a client must meet a minimum criterion or level for production rate to earn reinforcement. As a client's productivity consistently meets the criterion, the criterion is gradually increased or made more stringent. Thus, over time and with the use of effective behavior shaping methods, productivity may greatly increase from the initial criterion.

This design may be used with specific operant techniques to alleviate low production due to slow motor behavior or competing behaviors. In the case of low production behaviors, a changing time contingency may be introduced. This procedure requires setting a specific time limit for the completion of a task; it places the client under a time limit to receive reinforcement. A timing device, such as a kitchen timer or sports time-clock, may be used as a cue for the client and a subsequent indicator that a time limit was not met. As the client consistently meets the required time limit, the time allowed can be gradually decreased. This procedure has been successfully demonstrated and evaluated in a changing criterion design in a recent study performed with an institutionalized profoundly handicapped adult (Renzaglia, Wehman, Schutz, & Karan, 1977).

Isolated Treatment

Low production rates resulting from a client's excessive interfering behaviors poses a difficult remediation problem. Operant techniques employed within the work environment, such as manipulating different parameters of reinforcement, may not obtain successful results with particularly distractable or disruptive clients. With such clients, it may be advantageous to implement a treatment program in a relatively stimulus-free environment. Previously discussed training techniques

may be enhanced by reducing the number of environmental cues to which a client might attend. As a client demonstrates increased on-task behavior, the treatment program may be gradually faded back into the work environment.

A general strategy of behavior control which may be used in an isolated treatment program is differential reinforcement of other behavior. With this approach, the trainee might be reinforced for instances of *not* being bad (Repp, Dietz, & Dietz, 1976; Wehman & Marchant, Note 1), for instances where he was performing only the appropriate behavior (Thomas, Becker, & Armstrong, 1968), or for low rates of responding (Dietz & Repp, 1973). Differential reinforcement is used in most training efforts when the trainee is taught fine discriminations and also in the reinforcement of high work rates. It is certainly not limited to an isolated treatment program. However, in an isolated, relatively stimulus-free environment, it may be easier to use differential reinforcement of the target behavior.

Self-Management Strategies

The operant techniques and procedures discussed thus far pertain to external control on the part of a significant change agent, such as a workshop supervisor. These techniques involve staff-administered contingencies; if relied on entirely, they present potential disadvantages to self-sufficient vocational behavior (Kazdin, 1973b).

One major problem is that an external control approach precludes the development of self-directed choice behaviors on the part of severely developmentally disabled clients. Many rehabilitation professionals recognize this deficit as a primary obstacle in the community transition process for these clients (Wehman, 1975). Secondly, an external control approach presents a number of inherent drawbacks. Since it is difficult to notice all instances of an appropriate response, a workshop supervisor or counselor usually misses many opportunities to reinforce a client. Furthermore, the change agent himself may become a cue for a behavior rather than a nuatural environmental stimulus (Redd & Birnbrauer, 1969). This drawback relates also to the problem of transfer of training and durability of program progress. Thus, whenever possible, external control must not be viewed as an end itself, but rather as a means to train a client to control his or her *own* behavior and achieve self-selected goals.

Self-control has been defined in reference to "those behaviors an individual deliberately undertakes to achieve self-selected outcomes" (Kazdin, 1975, p. 192). Self-control training procedures which are applicable to the severely developmentally disabled include self-observation, self-reinforcement, and stimulus control.

Self-observation has been successfully implemented with mentally retarded clients through the use of behavioral graphs (Jens & Shores, 1969) and daily feedback of work performance from a videotape (DeRoo & Haralson, 1971). With this procedure, a client is trained to become aware of his or her work performance through immediate external feedback and through a visual record of work behavior. Gradually a client's self-observation can be faded to pictures of improvement in work performance.

Self-reinforcement is another strategy which holds potential, particularly in workshops that use a token economy as a motivational system. Two concepts of self-reinforcement are self-administered reinforcement and self-determined reinforcement. An important requirement of both self-administered reinforcement and self-determined reinforcement is that the individual is free to reward himself at any time, whether or not he performs a particular response (Skinner, 1953).

Self-administered reinforcement refers to a client taking a reinforcer himself, but under an externally determined criterion. Once a client's self-administered reinforcement response is shaped, it is possible to move toward *self-determined* reinforcement. This broader concept of self-reinforcement allows clients to determine their own work criteria (e.g., Glynn, 1970). It may be possible for contingency contracts to be set up between clients and workshop supervisors. Within such a contract would be a set rate of work and social skills which a client agrees to perform. In return, he or she can self-select reinforcement preferences for performance of the contract.

How severely handicapped trainees can manage their own work behavior was illustrated recently (Wehman, Schutz, Bates, Renzaglia, & Karan, 1977). The workers' production rates were assessed under no reinforcement, externally administered reinforcement, and self-administered reinforcement, with pennies used as reinforcers. Treatment conditions were presented in a Latin Square sequence to

control for order effects. Results indicated that through modeling and physical priming initially the trainee was able to reinforce himself and maintain a high level of production. Other research in workshop settings also supports the development of self-management skills in the severely handicapped (Helland, Paluck, & Klein, 1976; Nelson, Lipinski, & Black, in press).

Another self-control strategy which may be employed is stimulus control. *Stimulus control* refers to specific behaviors performed in the presence of specific stimuli which serve as cues and increase the probability that the behavior will be performed. For example, self-observation may function as a reinforcing consequence initially, but may also function as a discriminative stimulus for subsequent task-related behaviors.

Possible applications of the stimulus-control strategy, in workshops for the severely developmentally disabled, include altering stimuli which consistently lead to frustration-aggression situations, modifying cues that presumably contribute to task failure, or pairing positive stimuli with low preference tasks. Social behaviors such as eliciting social greetings, being on time, or appropriately using leisure time might also be developed through stimulus control.

Conclusion

This paper has attempted to provide direction in treatment strategies for workshop personnel who work with the severely developmentally disabled. It pointed out that a severely handicapped population presents a unique set of learning and behavior characteristics which can make traditional training and management techniques less applicable. It is strongly suggested that the hierarchy of strategies proposed for treatment be systematically examined with different learning/behavior problems to validate which methods are most effective with which workshop problems.

It should be apparent that the behavioral training and management procedures identified and sequenced in this paper can also be applied to behavior problems and deficits found in students or clients in other settings than workshops. It may be advantageous for parents, teachers, clinicians, and other practitioners to adopt a more planned approach to selection of behavior change procedures. Hopefully, the presentation in Table 1 takes one step toward a more systematic approach to ameliorating instructional and behavior problems in any setting.

Table 1 *A logically arranged hierarchy of procedures for Alleviating Work Problems*

I. Learning or Acquisition Problem——Discrimination Deficits

1. Give verbal instructions.
2. Model and give verbal instructions.
3. Give verbal and physical guidance.
4. Break task down into simpler steps (easy-to-hard sequence) and repeat steps 1-3.
5. Use cue redundancy or stimulus fading, depending on task.
6. Always accompany steps 1-5 with positive reinforcement for correct response.

II. *Learning or Acquisition Problems——Sensory-Motor Deficits* (Assess handicap to be sure there is a physical problem)

A. Poor motor coordination
   1. Give verbal instructions.
   2. Model and give verbal instructions.
   3. Give physical and verbal guidance.
   4. Break task down into simpler steps (easy-to-hard sequence) and repeat steps 1-3.
   5. Use prosthetic device or physical arrangement of materials.
   6. Use cue redundancy or stimulus fading, depending on task.
   7. Always accompany steps 1-6 with positive reinforcement for correct response.

B. Visually handicapped
   1. Give verbal instructions (detailed).

2. Give physical guidance and verbal instructions.
3. Use tactile cue redundancy and repeat steps 1-2.

C. Acoustically handicapped
1. Use gestural instructions.
2. Use physical guidance.
3. Break task down into simpler steps (easy-to-hard sequence) and repeat steps 1-2.
4. Use cue redundancy or stimulus fading, depending on task.

D. Deaf-blind
1. Use physical guidance.
2. Use tactile cue redundancy.

III. *Low Production-Slow Motor Behavior*

1. Use verbal prompt (e.g., "work faster").
2. Use verbal prompt plus model.
3. Use physical prompt (paired with verbal)
4. Increase reinforcer proximity.
   a. Pennies present.
   b. Back-up present also.
5. Increase frequency of receiving pennies.
6. Increase number of pennies and/or back-ups.
7. Increase frequency of redemption of pennies.
8. Give verbal reprimand plus no reinforcement.
9. Use response cost.
10. Use isolation-avoidance.
11. Use positive practice.
12. Present aversive stimuli.

IV. *Low Production—Interfering or Excessive Behavior*

Representative classes include:
a. nonfunctional competing behaviors,
b. bizarre noises,
c. out-of-seat behaviors,
d. aggression against objects,
e. aggression against people.

1. Use verbal reprimand and prompt.
2. Use verbal reprimand and physical prompt.
3. Increase reinforcement proximity (pennies, then back-up).
4. Increase frequency of receiving reinforcement (pennies).
5. Increase amount of pennies and/or back-up.
6. Increase frequency of redemption.
7. Use response cost.
8. Use time-out from positive reinforcement.
9. Use restraint.
10. Use overcorrection-positive practice.
11. Use isolation-avoidance.
12. Present aversive stimuli.

Reference Note

1. *Wehman, P., & Marchant, J. Reducing multiple problem behaviors in a profoundly handicapped child. Manuscript submitted for publication, 1977.*

References

Axelrod, S., Hall, R. V., Weis, L., & Rohrer, S. Use of self-imposed contingencies to reduce the frequency of smoking behavior. In M. J. Mahoney & C. E. Thoreson (Eds.), Self-control: Power to the person. Monterey, Calif.: Brooks/Cole, 1974.

Azrin, N. H., Gottlieb, L., Hughart, L., Wesolowski, M. D., & Rahn, T. Eliminating self-injurious behavior by educative procedures. Behavior Research and Therapy, 1975, 13, 101-111.

Bates, P., Wehman, P., & Karan, O. Evaluating the work performance of a developmentally disabled adolescent: Use of a changing criterion design. In O. Karan, P. Wehman, A. Renzaglia, & R. Schutz (Eds.), Habilitation practices with the severely developmentally disabled. Madison: University of Wisconsin Rehabilitation Research and Training Center, 1977.

Bellamy, G. T., Peterson, L., & Close, D. Habilitation of the severely and profoundly retarded: Illustrations of competence. Education and Training of the Mentally Retarded, 1975, 10, 174-186.

Brown, L., & Pearce, E. Increasing the production rate of trainable retarded students in a public school simulated workshop. Education and Training of the Mentally Retarded, 1970, 5, 15-22.

Clarke, A., & Hermelin, F. Adult imbeciles: Their abilities and trainability. The Lancet, 1955, 2, 337-339.

Crosson, J. A technique for programming sheltered workshop environments for training severely retarded workers. American Journal of Mental Deficiency, 1969, 73, 814-818.

DeRoo, W., & Haralson, H. Increasing workshop production through self-visualization on videotape. Mental Retardation, 1971, 9, 22-25.

Dietz, S., & Repp, A. Decreasing classroom misbehavior through the use of DRL schedules of reinforcement. Journal of Applied Behavior Analysis, 1973, 6, 457-464.

Gardner, W. I. Use of punishment procedures with the severely retarded: A review. American Journal of Mental Deficiency, 1969, 74, 86-103.

Glynn, E. L. Classroom applications of self-determined reinforcement. Journal of Applied Behavioral Analysis, 1970, 3, 123-132.

Gold, M. W. Stimulus factors in skill training of the retarded on a complex assembly task: Acquisition, transfer and rentention. American Journal of Mental Deficiency, 1972, 76, 517-526.

Gold, M. W. Research on the vocational habilitation of the retarded: The present, the future. In N. Ellis (ed.), international review of research in mental retardation (Vol. 6). New York: Academic Press, 1973.

Gold, M. W. Redundant cue removal in skill training for the mildly and moderately retarded. Education and Training of the Mentally Retarded, 1974, 9, 5-8.

Gold, M. W. Task analysis: A statement and an example using acquisition and production of a complex assembly task by the retarded blind. Exceptional Children, 1976, 43, (2), 78-87.

Gold, M. W., & Barclay, C. R. The learning of difficult visual discriminations by the moderately and severely retarded. Mental Retardation, 1973, 11, 9-11.

Gold, M. W., & Scott, K. G. Discrimination learning. In W. B. Stephens (Ed.), Training the developmentally young. New York: John Day, 1971.

Haring, N., & Brown, L. (Eds.). Teaching severely/profoundly handicapped individuals. New York: Grune & Stratton, 1976.

Hartmann, D., & Hall, R. V. The changing criterion design. Journal of Applied Behavior Analysis, 1976, 99, 527-532.

Helland, C., Paluck, R., & Klein, M. A. comparison of self and external reinforcement with the trainable mentally retarded. Mental Retardation, 1976, 14, 22-23.

Hollis, J. H. Development of perceptual motor skills in a profoundly retarded child: Part I, Prosthesis. American Journal of Mental Deficiency, 1967, 71, 941-952. (a)

Hollis, J. H. Development of perceptual motor skills in a profoundly retarded child: Part II, Consequence, change and transfer. American Journal of Mental Deficiency, 1967, 71, 953-963. (b)

Hunter, J., & Bellamy, G. T. Cable harness construction for severely retarded adults: A demonstration of training techniques. AAESPH Review, 1976, 1 (7), 2-13.

Irvin, L. General utility of easy-to-hard discrimination training procedures with the severely retarded. Education and Training of the Mentally Retarded, 1976, 11 (3), 247-250.

Jens, K., & Shores, R. Behavioral graphs as reinforcers for work behavior of mentally retarded adolescents. Education and Training of the Mentally Retarded, 1969, 4, 21-26.

Kazdin, A. E. The effect of response cost and aversive stimulation in suppressing punished and nonpunished speech disfluencies. Behavior Therapy, 1973, 4, 73-82. (a)

Kazdin, A. E. Toward a client administered token reinforcement program. Education and Training of the Mentally Retarded, 1973, 8, 4-11. (b)

Kazdin, A. E. Behavior modification in applied settings. Homewood, Ill.: Dorsey Press, 1975.

Kliebhahn, J. Effects of goal setting and modeling on job performances of retarded adolescents. American Journal of Mental Deficiency, 1967, 72, 220-226.

MacDonough, T. S., & Forehand, R. Response-contingent time-out: Important parameters in behavior modification with children. Journal of Behavior Therapy and Experimental Psychiatry, 1973, 4, 231-236.

Madsen, C., Becker, W., Thomas, D., Koser, L., & Plager, E. An analysis of the reinforcing function of "sit-down" commands. In R. K. Parker (Ed.), Readings in educational psychology. Boston: Allyn & Bacon, 1970, 265-278.

Nelson, R. O., Lipinski, D., & Black, J. L. The reactivity of adult retardates self-monitoring: A comparison among behaviors of different valences, and a comparison with token reinforcement. Psychological Record, in press.

Redd, W. H., & Birnbrauer, J. S. Adults as discriminative stimuli for different reinforcement contingencies with retarded children. Journal of Experimental Child Psychology, 1969, 7, 440-447.

Repp, A., Dietz, S., & Dietz, D. Reducing inappropriate behaviors in classrooms and in individual sessions through DRO schedules of reinforcement. Mental Retardation, 1976, 14, 11-14.

Renzaglia, A., Wehman, P., Schutz, R., & Karan, O. Use of cue redundancy and positive reinforcement to accelerate production rates in two profoundly retarded workers. In O. Karan, P. Wehman, A Renzaglia, & R. Schutz (Eds.) Habilitation practices with the severely developmentally disabled. Madison: University of Wisconsin Rehabilitation Research and Training Center 1977.

Rusch, F., & Close, D. Overcorrection: A procedural evaluation. AAESPH Review, 1976, 1 (5), 32-45.

Schroeder, S. Parametric effects of reinforcement frequency, amount of reinforcement, and required response force on sheltered workshop behavior. Journal of Applied Behavior Analysis, 1972, 5, 431-441.

Schutz, R., Wehman, P., Renzaglia, A., & Karan, O. Efficacy of contingent social disapproval on inappropriate verbalizations of two severely retarded males. Behavior Therapy, in press.

Skinner, B. F. Science and human behavior. New York: Macmillan, 1953.

Thomas, D., Becker, W., & Armstrong, M. Production and elimination of disruptive classroom behavior by systematically varying teachers' behavior. Journal of Applied Analysis, 1968, 1, 35-45.

Wehman, P. Behavioral self-control with the mentally retarded. Journal of Applied Rehabilitation Counseling, 1975, 6, 27-34.

Wehman, P., Renzaglia, A., Schutz, R., & Karan, O. Stimulating productivity in two profoundly retarded workers through mixed reinforcement contingencies. In O. Karan, P. Wehman, A. Renzaglia, & R. Schutz (Eds.), Habilitation practices with the severely developmentally disabled. Madison: University of Wisconsin Rehabilitation Research and Training Center, 1977.

Wehman, P., Schutz, R., Bates, P., Renzaglia, A., & Karan, O. Self-management programs with mentally retarded workers: Implications for developing independent vocational behavior. In O. Karan, P. Wehman, A. Renzaglia, & R. Schutz (Eds.) Habilitation practices with the severely developmentally disabled. Madison: University of Wisconsin Rehabilitation Research and Training Center, 1977.

Wehman, P., Schutz, R., Renzaglia, A., & Karan, O. Use of positive practice to facilitate increased work productivity and instruction following in profoundly retarded adolescents. In O. Karan, P. Wehman, A. Renzaglia, & R. Schutz (Eds.), Habilitation practices with the severely developmentally disabled. Madison: University of Wisconsin Rehabilitation Research and Training Center, 1977.

Williams, P. Industrial training and remunerative employment of the profoundly retarded. Journal of Mental Subnormality, 1967, 13, 14-23.

Zeaman, D. & House, B. The role of attention in retardate discrimination learning. In N. Ellis (Ed.), Handbook of mental deficiency. New York: McGraw-Hill, 1963.

Zimmerman, J., Overpeck, C., Eisenberg, H., & Garlick, B. Operant conditioning in a sheltered workshop. Rehabilitation Literature, 1969, 30, 323-334.

Pre/Post-test with Key

1. A child's first rolling is segmental. T or F?

2. Children's movement patterns go from total body _____ to _____.

3. Initial efforts at grasp involve finger _____ and forearm _____.

4. Independent sitting and what means of mobility occur at the same time?

5. Name two activities which precede developmentally crude palmar grasp:
   a.
   b.

6. At approximately what age does fine pincer grasp appear?

   a. 0-4 months
   b. 4-8 months
   c. 8-12 months
   d. 12-18 months

7. Describe the posture of a child taking his/her first steps.

8. Children with positive supporting reaction should be encouraged to walk. T or F?

9. Which type of rolling pattern should be encouraged during training?

   a. nonsegmental with trunk extension
   b. segmental
   c. nonsegmental

10. Name and describe two ways children get to sitting:
    a.
    b.

11. List four steps in the development of prehension in the proper sequence:
    a.
    b.
    c.
    d.

12. List the onset and disappearance for the following reflexes:

    a. asymmetrical tonic neck
    b. symmetrical tonic neck
    c. protective extension forward
    d. tilting in standing

13. Describe mature gait.

14. What reflex must be integrated to allow for reciprocal crawl?

15. Develop a sequence of three prerequisites for independent sitting:
    a.
    b.
    c.

16. Arrange these in proper developmental sequence:

beginning attempts at propulsion, weight shift	a.
reciprocal crawl	b.
symmetrical tonic neck reflex	c.
advanced spinal extension	d.

17. Identify five basic components involved in rapid toilet training:
    a.
    b.
    c.
    d.
    e.

18. What is self-initiated toileting?

19. How do you determine the best times to put the child on the toilet?

20. What behaviors are reinforced when toilet training?

21. You should not confuse toilet training by also teaching clothes adjustment and hand washing to the child, T or F?

22. Feeding training should always be a pleasant experience. T or F?

23. When being fed it is all right if the child's head is tilted back slightly so food will not fall out of his/her mouth. T or F?

24. If the child gags or chokes, quickly slap him/her on the back. T or F?

25. Feeding in the correct position does not need to be stressed until later, if the child is usually uncooperative unless being fed in mother's arms. T or F?

26. To assist a child who has some feeding skills (holds spoon and has hand to mouth pattern) you should sit on his/her dominant side. T or F?

27. List five problems in feeding often present in persons with central nervous system damage:

    a.
    b.
    c.
    d.
    e.

28. When assisting a cerebral palsy child, always put clothes on the more affected arm or leg first. T or F?

29. Name three general physical difficulties experienced by a cerebral palsy child when dressing and undressing him/herself, i.e., inability to grasp:

a.
b.
c.

30. Keeping the knee straight while putting on a long leg brace and inserting the caliper is easier than when the knee is flexed. T or F?

31. Name three prerequisites for dressing training:

a.
b.
c.

32. At two years, a "normal" child can remove his/her socks, shoes, and pants, and likes to undress. T or F?

33. List five behaviors emitted by a child that can be used to demonstrate early responsiveness:

a.
b.
c.
d.
e.

34. Place the following child precommunicative behaviors in chronological order.

vocal imitation	a.
mutual imitation	b.
vocal contagion	c.
showing an object	d.
taking an object	e.
pointing	f.
giving	g.

35. Children acquire situational comprehension prior to comprehension of individual word meaning. T or F?

36. List two uses of early communication:

a.
b.

37. List four comprehension strategies used by children to stimulate language understanding:

a.
b.
c.
d.

38. List three early semantic functions:

a.
b.
c.

39. List two common errors in the child's early verbal production and give examples:

a.
b.

40. List three potential initiation response modes:

a.
b.
c.

41. List the three major areas of programming in Kent's language program:

a.
b.
c.

42. What component does MacDonalds' program have that is not present in Guess, Baer, and Sailor?

43. What early comprehension skills do Bricker and Bricker stress that few of the other interventionists stress?

44. Children first begin to use objects functionally (e.g., combs to comb with):

a. prior to 8 months
b. between 12 and 18 months
c. sometime after 24 months
d. sometime after 32 months but prior to 40 months of age

45. The first instances of turntaking behavior are generally reported to occur prior to:

a. five months or earlier
b. one year
c. two years
d. eighteen months

46. List the cognitive stage of the normal child that you would expect to exhibit:

a. extensive mouthing behavior
b. shaking and waving objects
c. functionally using objects
d. engaging in representational pretend play

47. List two problems encountered in vocational training for severely/profoundly handicapped:

a.
b.

48. List two components of a vocational curriculum:

a.
b.

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49. List five techniques to improve problems of low work production:

a.
b.
c.
d.
e.

50. Briefly describe three potential vocational tasks for students:

a.
b.
c.

Pre/Post-test Key

1. False
2. Flexion to extension
3. Flexion and pronation
4. Crawling
5. Hand regard, swiping at object, hand to object regard
6. d
7. Wide base (feet apart) hands in high guard
8. False
9. b
10. Ventral push: all fours, raise trunk and abduct one leg and sit
    Dorsal push: lateral position, pushes against floor with one arm, raises legs off floor slightly, pushes to sitting
11. Traction reaction
    Avoidance reaction
    Palmar grasp
    Swiping at objects
    Oriented avoiding
    Instinctive grasp
    Orientation fractionation
12. a - 0 months to 4 months
    b - 4-6 months to 8-12 months
    c - 6-7 months to persists
    d - 12-21 months to persists
13. Heel of forward foot touches when toe of back foot touches
14. Symmetrical tonic neck reflex
15. Trunk extension, head control, balance in sitting, protective extension down, forward, side, back
16. d
    a
    c
    b
17. a) frequent trips to toilet with reinforcement for elimination
    b) cleaning up accidents by child extensively
    c) regular reinforcement for being dry
    d) development of self-initiated toileting
    e) training toileting-related skills as well, i.e., handwashing

18. Going to the toilet under bladder/bowel control

19. Observe and record over several days or weeks the times when child goes to toilet or has accident

20. Elimination in toilet, and being dry

21. False

22. True

23. False

24. False

25. False

26. True

27. Bite reflex, gag reflex, tongue thrust, drooling, poor lip and jaw closure, positioning, extensor thrust (of trunk)

28. True

29. Difficulty in looking at what s/he is doing
Insufficient balance when s/he starts using both hands
Associated reactions
Poor coordination between two hands
Insufficient find coordination of the fingers
Trying to hold with one hand while s/he moves the other
Inability to grasp
Having to hold and life clothes without falling back (limited range of motion)
Fastenings at back

30. False

31. Imitates motion directions
Follows verbal directions
Relates clothing to appropriate part of body
Sitting balance
Use of one hand
Range of motion

32. True

33. Cry
Laugh
Localize
Startle
Cessation of movement

34. a) vocal contagion
b) mutual imitation
c) vocal imitation
d) taking an object
e) showing an object
f) giving
g) pointing

35. True

36. Demand/request, indicate

37. Look at object another looks at
Do as you usually do
Imitate the actions that another performed
Respond to informational cues
Act on the only object present,
etc.

38. Recurrence
Existence
Nonexistence
Disappearance
Cessation
Rejection

39. Over-inclusion - including objects in class when in fact they do not belong (calling cat a dog, e.g., they both are animals and have four legs).
Under-inclusion - failing to include an object in a class when in fact it should belong (failing to call a daisy a flower but calling a rose a flower).

40. Signing
Communication board
Binary choice (head turn-eye gaze)
Writing

41. 1) prerequisite skills or attending sitting, etc.
2) receptive labeling
3) expressive labeling

42. Representation of semantic work chaining based on normal developmental model.

43. Early cognitive schemes in relation to objects.
Functional object use.

44. b

45. a

46. a. stage 1
b. stage 2
c. stage 5
d. stage 6

47. a) behaviors that interfere with work
b) low productivity levels
c) sensory - motor deficits of students
d) failure to attend to relevent cues of a task
e) relating prevocational curriculum to vocational placement situation

48. a) workshop skills
b) daily living skills
c) work habits and behaviors
d) social skills

49. a) verbal prompt
    b) physical prompt (paired with verbal)
    c) reinforcer proximity
    d) increased frequency of SR
    e) increased frequency of redemption of tokens
    f) verbal reprimand
    g) response cost
    h) isolation avoidance
    i) positive practice
    j) aversive stimuli

50. a) simple janitorial
    b) plant care
    c) lollipop task and numerous others

Bibliography

Motor Programs

I. Developmental

A. Primary Readings

Auxter, D. Evaluation of perceptual motor training programs. Teaching Exceptional Children, 1972, 4 (2), 89-97.

Bobath, B. Treatment principles and planning in cerebral palsy. Physiotherapy, 1963, 49, 122-124.

Bobath, B. The very early treatment of cerebral palsy. Developmental Medicine and Child Neurology, 1967, 9, 373-390.

Chandler, S. S. & Adams, M. A. Multiply handicapped children motivated for ambulation through behavior modification. Physical Therapy, 1972, 52 (3), 399-401.

Cratty, B. J. Motor activity and the education of retardates. Philadelphia: Lea & Febiger, 1969, Chapters 1, 2, 4, 5, 7, & 8.

Ethun, C. A. & D'Angelo, R. J. Gait training for the severely mentally retarded. Journal of the American Physical Therapy Association, 1963, 43, 179-180.

Horner, R. D. Establishing use of crutches by a mentally retarded spina bifida child. Journal of Applied Behavior Analysis, 1971, 4 (3), 183-189.

Loynd, J. & Barclay, A. A case study in developing ambulation in a profoundly retarded child. Behavior Research & Therapy, 1970, 8 (2), 207.

MacAulay, M. E. & MacMillan, M. Teaching severely retarded children to walk. Developmental Medicine and Child Neurology, 1965, 7, 549-566.

O'Brien, F., Azrin, N. H. & Bugle, C. Training profoundly retarded children to stop crawling. Journal of Applied Behavior Analysis, 1972, 5 (2), 131-137.

Striefel, S. Managing behavior 7––Behavior modification: Teaching a child to imitate. Lawrence, Kansas: H & H Enterprises, Inc., 1974.

Walter, G. Cremin, T., Hughes, L. & Dressel, M. Task force on play curriculum based on sensorimotor development. Paper for Department of Behavioral Disabilities University of Wisconsin, Madison, Wisconsin.

Wilson, V. & Parks, R. Promoting ambulation in the severely retarded child. Mental Retardation, 1970, 8, 17-19.

B. Motor Programs and Curricula

Anderson, D. R., Hodson, G. D. and Jones, W. G. (Eds.). Instructional Programs for the severely handicapped student. Springfield, Illinois: Charles C. Thomas, 1974.

Bergstrom, D. & Coles, C. H. Basic positioning procedures. Minneapolis, Minnesota: A-V Publications Office, Sister Kenny Institute, 1971.

610

Beter, T. R. & Cragin, W. E. The mentally retarded child and his motor behavior. Springfield, Illinois: Charles C. Thomas, 1972.

Brody, J. F. & Smilovitz (Eds.) APT: A training program for citizens with severely or profoundly retarded behavior. Spring City, Pennsylvania: Pennhurst State School and Hospital, 1974.

Frostig, M. Frostig program for the development of visual perception. Chicago: Follett Publishing Co., 1967.

Geddes, D. Physical and recreational programming for severely and profoundly retarded individuals. Washington, D. C.: American Association for Health, Physical Education & Recreation: Information and Research Utilization Center in Physical Education and Recreation for the Handicapped, 1974.

Ingenthron, G. (Ed.) Training programs used in the Title I Program. Parsons, KS: Parsons State Hospital and Training Center. Prepared for dissemination at 99th Annual Meeting of AAMD. May, 1975.

Jacobson, B. Project EARN. 3833 N. War Memorial Drive, Peoria, Illinois 61603.

Keiser, A. F. The Marshalltown Project Behavioral Prescription Guide (Manual II b-Motor) Department of Special Education, Marshall-Poweshiek Joint County School System 9 Westwood Drive, Marshalltown, Iowa 50158.

Levell, K. An evaluation of the Title I program for the 1973-1974 School year. Selah, Washington: Yakima Valley School, 1973.

Linford, A. G. & Jeanrenaud, C. (Eds.) Systematic instruction for retarded children. The Illinois Program. Part IV Motor performance and recreation instruction. Danville, Illinois: Interstate Printers and Publishers, 1972.

Marx, O. H. Physical activities for handicapped children in the home. Iowa City, Iowa: University Hospital School, University of Iowa, 1972.

Portage guide to early education (Motor development section). Portage, Wisconsin: Cooperative Educational Service, 1972.

Trimmer, K. A. & Boyd, L. A. A comprehensive curriculum of basic developmental skills for children. Western Carolina Center Paper, 4 (5), 1974.

Vincent-Smith, L., Bogart, B., Dean, D. & Rothacker, S. Gross motor curriculum for young developmentally delayed children. Infant, Toddler, and Preschool Research and Intervention Project, JFK Center, George Peabody College, Nashville, Tennessee.

Wessel, J. I Can Curriculum. Northbrook, Illinois: Hubbard Press (Hubbard Scientific Co.), 1974.

C. Supplemental Readings

Bobath, K. & Bobath, B. An analysis of the development of standing and walking patterns in patients with cerebral palsy. Physiotherapy, 1962, 48, 144-153.

Burdett, A. An examination of selected pre-vocational techniques utilized in programs for the mentally retarded. Mental Retardation, 1963, 1, 230-237.

Dunst, C. J., Kinsey, T., Johnson, D. & Crouse, C. Abnormal movement patterns in cerebral palsied children as a function of sensorimotor training. Western Carolina Center Paper, 4 (10), 1974.

Edgar, C. L., Ball, T. S., McIntyre, R. B. & Shotwell, D. M. Effects of sensorimotor training on adaptive behavior. American Journal of Mental Deficiency, 1969, 73, 713-719.

Scarnati, R. The role of the physical therapist in special education. Rehabilitation Literature, 1971, 32, 130-138.

II. Programming Prosthetic Environments

A. Primary Readings:

Bobath, K., and Bobath, B. The facilitation of normal postural reactions and movements in the treatment of cerebral palsy. Physiotherapy, 50, 1964.

Crickmay, Marie C. Speech therapy and the Bobath approach to cerebral palsy. Springfield, Illinois: Charles C. Thomas, 1966.

Finnie, Nancy R. Handling the young cerebral palsied child at home. New York, New York: E. P. Dutton and Company, 1970.

Hoffman, Ruth B. How to build special furniture and equipment for handicapped children. Springfield, Illinois: Charles C. Thomas, 1970.

Macey, P. G., Stancliffe, J., Beumer, B., & Roper, W. Mobilizing multiply handicapped children——A manual for the design and construction of modified wheelchairs. Lawrence, Kansas: Division of Continuing Education, University of Kansas, 1974.

Palmer, Martin F. Studies in clinical techniques II. Normalization of chewing, sucking and swallowing reflexes in cerebral palsy: a home program. Journal of Speech Disorders, 1947, 12, 415-418.

Pearson, Paul H., & Williams, Carol E. (Eds.) Physical therapy services in the developmental disabilities. Springfield, Illinois: Charles C. Thomas, 1972.

Prouty, Lynne and Thompson, Linda. Factors in planning resources. University of Kansas, Habilitation Personnel Training Project, Lawrence, Kansas, 1975.

Robinault, Isabel P. Functional aids for the multiply handicapped. Hagerstown, Maryland: Harper and Row, Medical Department, 1973.

Rosenberg, Charlot. Assistive devices for the handicapped. Minneapolis Minnesota: A-V Publications Office, Sister Kenny Institute, 1968.

Swinyard, Chester A. The child with spina bifida. Institute of Rehabilitation Medicine, New York University Medical Center, New York, New York, 1974.

Yandric, Gayle. A frame for supporting the cerebral palsied child. American Journal of Occupational Therapy, 1966, 20, 33.

Zelle, R. Procedure to reduce sensitivity to texture and promote oral hygiene. Sacramento, California: Alta Regional Center, 1974.

B. Supplementary Readings:

Ball, T. S., Hendrickson, H., & Clayton, J. A special feeding technique for chronic regurgitation. American Journal of Mental Deficiency, 1974, 78, 486-493.

Bare, C., Boettke, E., & Waggoner, N. Self-help clothing for handicapped children. Chicago, Illinois: National Association for Crippled Children and Adults, 1962.

Bergstrom, D., & Coles, C. H. Basic positioning procedures. Minneapolis, Minnesota: A-V Publications Office, Sister Kenny Institute, 1971.

Eddington, Connie. Spoon feeding your child. State of Utah, Department of Social Services, Division of Health - MCH, 44 Medical Drive, Salt Lake City, Utah.

Eddington, Connie. Teaching your child straw drinking to encourage sucking. State of Utah, Department of Social Services, Division of Health - MCH, 44 Medical Drive, Salt Lake City, Utah.

Flaherty, P. T., & Jukovich, S. J. Transfers for patients with acute and chronic conditions. Minneapolis, Minnesota: A-V Publications Office, Sister Kenny Institute, 1970.

Gunzburg, A. L. Architecture and mental subnormality: Sensory experiences in the architecture for the mentally subnormal child. Journal of Mental Subnormality, 1968, 4, 57-61.

Holser-Buehler, Patricia. The Blanchard method of feeding the cerebral palsied. American Journal of Occupational Therapy, 10, 1, 1966.

Institute of Rehabilitation Medicine. Bibliography on self-help devices and orthotics: 1950-1967. Rehabilitation Monograph 35. New York: New York University Medical Center, 1968.

Kimbrell, D. L., Kidwell, F., & Hallum, G. Institutional environment developed for training severely and profoundly retarded. Mental Retardation, 1967, 5, 34-37.

Lowman, E., & Klinger, J. L. Aids to independent living: Self-help for the handicapped. New York: McGraw-Hill, 1969.

Rux, Robert E. Suggestion from the field: standing platforms for nonambulatory patients. Physical Therapy, 1971, 51, 9.

Toohey, P., & Larson, C. W. Range of motion exercise: Key to joint mobility. Minneapolis, Minnesota: A-V Publications Office, Sister Kenny Institute, 1968.

Watson, L. S. Applications of behavior-shaping devices to training severely and profoundly mentally retarded children in an institutional setting. Mental Retardation, 1968, 6, 21-23.

Zimmerman, M. Self-help devices for rehabilitation: Part I. Dubuque, Iowa: William C. Brown, 1958.

Zimmerman, M. Self-help devices for rehabilitation: Part II. Dubuque, Iowa: William C. Brown, 1965.

III. Normal Motor Development

Caplan, F. (ed) The First Twelve Months of Life. Grosset & Dunlap, 1976.

Caplan, F. (ed) The Second Twelve Months of Life. Grosset & Dunlap, 1976.

Colangelo, C. A Normal Baby: The Sensory-Motor Processes of the First Year. Valhalla, New York: Blythdale Children's Hospital.

McGraw, M. The Neuromuscula Maturation of the Human Infant. New York: Hafner Publishing Co., 1945.

Pieper, A. Cerebral Function in Infancy and Childhood. New York: Consultants Bureau, 1963.

White, B. L. The First Three Years of Life. Englewood Cliffs, N. J.: Prentice Hall, Inc., 1975.

Auxter, D. Motor skill development in the profoundly retarded. Training School Bulletin, 1971, 68, 5-9.

Azrin, N. H., & Armstrong, P. M. The "mini-meal"—A method for teaching eating skills to the profoundly retarded. Mental Retardation, 1973, 11, 9-13.

Azrin, N. H., & Foxx, R. M. A rapid method of toilet training the institutionalized retarded. Journal of Applied Behavior Analysis, 1971, 4, 89-99.

Axrin, N. H., & Foxx, R. M. Toilet training in less than a day. New York: Pocket Books, 1974.

Azrin, N. H., Schaeffer, R. M., & Wesolowski, M. D. A rapid method of teaching profoundly retarded persons to dress by a reinforcement - guidance method. Mental Retardation, 1976, 14, 29-33.

Baker, D. Reinforcement therapy for behavior problems in severely retarded children. American Journal of Orthopsychiatry, 1971, 41, 124-135.

Barton, E. S., Guess, D., Garcia, E., & Baer, D. M. Improvements of retardates' mealtime behaviors by timeout procedures using multiple-baseline techniques. Journal of Applied Behavior Analysis, 1970, 3, 77-84.

Baumeister, A. A., & Foreland, R. Social facilitation of body rocking in severely retarded patients. Journal of Clinical Psychology, 1970, 26, 303-305.

Baumeister, A. A. & Klosowski, R. An attempt to group toilet train severely retarded patients. Mental Retardation, 1965, 3, 24-26.

Bostow, D. E., & Bailey, J. B. Modification of severe disruptive and aggressive behavior using brief time-out and reinforcement procedures. Journal of Applied Behavior Analysis, 1969, 2, 31-37.

Bradtke, L. Intensive play: A technique for building affective behaviors in profoundly mentally retarded children. Education and Training of the Mentally Retarded, 1972, 7, 8-13.

Campbell, P. H., Green, K. M., & Carlson, L. M. Approximating the norm through environmental and child-centered prosthetics and adaptive equipment. In E. Sontag (ed.), Educational programming for the severely and profoundly handicapped. Reston, Virginia: The Council for Exceptional Children, 1977, pp. 300-320.

Copeland, K. (Ed.), Aids for the severely handicapped. New York: Grune & Stratton, 1974.

Copeland, M., Ford, L., & Solon, N. Occupational therapy for mentally retarded children. Baltimore: University Park Press, 1976.

Edwards, K. A. Physical restraint as time-out in therapy. The Psychological Record, 1974, 24, 393-97.

Favell, J. E., & Cannon, P. R. A sample device for protection against injury during convulsions. Mental Retardation, 1977, 15, 10-11.

Finnie, N. Handling the young cerebral palsied child at home (2nd Edition). New York: E. P. Dutton & Co., 1974.

Ford, L. J. Teaching dressing skills to a severely retarded child. The American Journal of Occupational Therapy, 1975, 29, 87-92.

Foreyt, J. P., & Parks, J. T. Behavioral controls for achieving weight loss in the severely retarded. Journal of Behavior Therapy and Experimental Psychiatry, 1975, 6, 27-29.

Garber, N. B. Operant procedures to eliminate drooling behavior in a cerebral palsied adolescent. Developmental Medicine and Child Neurology, 1971, 13, 641-644.

Hamilton, J., & Allen, P. Ward programming for severely retarded institutionalized residents. Mental Retardation, 1967, 6, 22-25.

Hamilton, J., Stephens, L. Y., & Allen, P. Controlling aggressive and destructive behavior in severely retarded institutionalized residents. American Journal of Mental Deficiency, 1967, 71, 852-856.

Henriksen, K., & Doughty, R. Decelerating undesired mealtime behavior in a group of profoundly retarded boys. American Journal of Mental Deficiency, 1967, 72, 40-44.

Hollis, J. H., & Gorton, C. E. Training severely and profoundly developmentally retarded children. Mental Retardation, 1967, 5, 20-24.

Horner, R. D. Establishing use of crutches by a mentally retarded spina bifida child. Journal of Applied Behavior Analysis, 1971, 4, 183-189.

Horner, R. D., & Keilitz, I. Training mentally retarded adolescents to brush their teeth. Journal of Applied Behavior Analysis, 1975, 8, 301-309.

Kaufman, M. E. The effects of institutionalization on development of stereotyped and social behaviors in mental defectives. American Journal of Mental Deficiency, 1977, 81, 486-491.

Kaufman, J. M., & Snell, M. E. Managing the behavior of severely handicapped persons. In E. Sontag (Ed.), Educational programming for the severely and profoundly handicapped. Reston, Virginia: The Council for Exceptional Children, 1977, pp. 203-218.

Kohlenberg, R. J. The punishment of persistent vomiting: A case study. Journal of Applied Behavior Analysis, 1970, 3, 241-245.

Levine, M., & Elliott, C. Toilet training for profoundly retarded with a limited staff. Mental Retardation, 1970, 8 (3), 48-50.

Luckey, R. E., Watson, C. M., & Mussick, J. K. Aversive conditioning as a means of inhibiting vomiting and rumination. American Journal of Mental Deficiency, 1968, 73, 139-142.

MacPherson, E.L.R. Control of involuntary movement. Behavior Research and Therapy, 1967, 5, 143-145.

Morgan, J., & O'Brien, J. S. The counterconditioning of a vomiting habit by sips of gingerale. Journal of Behavior Therapy and Experimental Psychiatry, 1972, 3, 135-137.

Nawas, M. M., & Braun, S. H. The use of operant techniques for modifying the behavior of the severely and profoundly retarded. Part II: The techniques. Mental Retardation, 1970, 8, 18-24.

O'Brien, F., Azrin, N. H., & Bugle, C. Training profoundly retarded children to stop crawling. Journal of Applied Behavior Analysis, 1972, 5, 131-137.

O'Brien, F., Bugle, C., & Azrin, N. H. Training and maintaining a retarded child's proper eating. Journal of Applied Behavior Analysis, 1972, 5, 67-72.

Pearson, P. H. (Ed.), Physical therapy services in the developmental disabilities. Springfield, Illinois: Charles C. Thomas, 1972.

Poole, A. D., & Yates, A. J. The modification of excessive frequency of urination: A case study. Behavior Therapy, 1975, 6, 78-86.

Robinault, I. P. (Ed.), Functional aids for the multiply handicapped. New York: Harper & Row, 1973.

Safford, P. L., Gregg, L. A., Schneider, G., & Sewell, J. M. A stimulation program for young sensory-impaired, multihandicapped children. Education and Training of the Mentally Retarded, 1976, 11, 12-17.

Sobell, L. C., Schaefer, H. H., Sobell, M. B., & Kremer, M. E. Food priming: A therapeutic tool to increase the percentage of meals bought by chronic mental patients. Behavior Research and Therapy, 1970, 8, 339-345.

Stainback, S., Healy, H., Stainback, W., & Healy, J. Teaching basic eating skills. AAESPH Review, 1976, 1, 26-35.

Treffry, D., Martin, G. L., Samels, J. L., & Watson, C. Operant conditioning of grooming behavior of severely retarded girls. Mental Retardation, 1970, 8 (4), 29-33.

Utley, B., Holvoet, J., & Barnes, K. Handling, positioning, and feeding the physically handicapped. In E. Sontag (ed.), Educational programming for the severely and profoundly handicapped. Reston, Virginia: The Council for Exceptional Children, 1977, pp. 279-299.

Vukelich, B., & Hake, D. F. Reduction of dangerously aggressive behavior in a severely retarded resident through a combination of positive reinforcement procedures. Journal of Applied Behavior Analysis, 1971, 4, 215-225.

White, J. C., & Taylor, D. J. Noxious conditioning as a treatment for rumination. Mental Retardation, 1967, 5, 30-33.

Whitman, T. L., Mercurio, J. R., & Caponigri, V. Development of social responses in two severely retarded children. Journal of Applied Behavior Analysis, 1970, 3, 133-138.

Wilson, V., & Parks, R. Promoting ambulation in the severely retarded child. Mental Retardation, 1970, 8 (5), 17-19.

Developing Communication Skills with Severe and Multiply Handicapped Persons:

A Selected List of References

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Bluma, S. M., Shearer, M. S., Frohman, A. H. and Hilliard, J. M. Portage Guide to Early Education. The Portage Project, CESA 12, Portage, WI (1976).

Bonvillian, J. D. and Nelson, K. E. Sign language acquisition in a mute autistic boy. Journal of Speech and Hearing Research, (in press).

Bricker, W. A. and Bricker, D. B. The use of programmed language training as a means for differential diagnosis and educational remediation among severely retarded children. Final Report, George Peabody College, Contract OE6 2-7-070218-1629. U. S. Office of Education

Carrier, J. K., Jr. and Peak, T. Non-Speech Language Initiation Program. Lawrence, Kan.: H & H Enterprises (1975).

Clark, C. R., Moores, D. F. and Woodcock, R. W. The Minnesota Early Language Development Sequences. Research, Development and Demonstration Center in Education of Handicapped Children, University of Minnesota, Minneapolis.

Dixon, C. and Curry, B. Some thoughts on the communication board. JSHD 38, pp. 73-88, (1973).

Fristoe, M. (Ed.) Language Intervention Systems for the Retarded: A catalog of original Structured Language Programs in use in the U.S. Lurleen B. Wallace Developmental Center. P.O. Box 2224, Decatur, Alabama (1976).

Fristoe, M. Language Intervention Systems: Programs published in kit form. In Lloyd, L. Communication Assessment and Intervention Strategies. Baltimore: University Park Press (1976).

Fulwiler, R. L. and Fouts, R. S. Acquisition of American Sign Language by a noncommunicating autistic child. Journal of Autism and Childhood Schizophrenia, 1976, Vol 6, pp. 43-51.

Guess, D., Sailor, W. and Baer, D. A behavioral-remedial appraoch to language training for the severely handicapped. In E. Sontag, J. Smith, and N. Certo (eds.) Educational programming for severely and profoundly handicapped. Special publication of Division on Mental Retardation, The Council for Exceptional Children, (1977).

Harris, D., Lippert, J. and Yoder, D. E. Blisssymbolis: An Augmentative Symbol Communication System for Non-Vocal Severely Handicapped Children. In York, R. and Edgar, E. Teaching the Severely Handicapped - Volume IV. New York: Grune and Stratton (In press).

Hedrick, D. L., Kemp, J. C. and Thompson, M. D. Communication Programs for the Multi-Handicapped Deaf-Blind Child. Northwest Regional Center for Deaf-Blind Children, 3411 S. Alaska St., Seattle, WA (1976).

Kahn, J. V. Relationship of Piaget's sensorimotor period to language acquisition of profoundly retarded children. American Journal of Mental Deficiency, 1975, 79, 640-643.

Reprinted by permission of authors.

Kent, L. Language acquisition program for the severely retarded. Champaign, Illinois: Research Press (1974).

Kopchick, G. A., Jr., and Lloyd, L. E. Total communication programming for the severely language impaired: A 24-hour approach. Chap. 12 in Communication assessment and intervention strategies. Lyle E. Lloyd (Ed.) Baltimore: University Park Press (1976).

Kopchick, G. A., Jr., Rombach, D., and Smilovitz, R. A total communication environment in an institution. Mental Retardation, (1975) 13, 22-23.

Lackner, J. R. A developmental study of language behavior in retarded children. Neuropsychologia, 1968, 6, 301-320.

Lloyd, L. L. Communication Assessment and Intervention Strategies. Baltimore: University Park Press (1976).

LoVaas, O. F. A program for the establishment of speech in psychotic children. In J. K. Wing (ed.), Childhood Autism. Oxford, England, Pergammon Press, pp. 115-144.

Lynch, V., Shoemaker, S., White, O. Training needs survey. AAESPH, 1976, 1, 1-16.

MacDonald, J. Ready, Set, Go. The Nisonger Center, Ohio State University (1975).

McDonald, E. T. and Schultz, A. R. Communication boards for cerebral palsied children. JSHD, 1973, 173-188.

McLean, J., Yoder, D. E. and Schiefelbusch, R. Language Intervention with the Retarded: Developing Strategies. Baltimore: University Park Press (1972).

McLean, L. and McLean, J. A language training program for nonverbal autistic children, JSHR, 1974, 35, 186-193.

McLean, J. and Snyder, L. A transactional approach to early language training: Derivation of a model system. Final Report, Contract No. OEC-0-74-9185. Washington D.C.: U.S. Office of Education, BEH (1976).

Miller, A. and Miller, E. Cognitive-developmental training with elevated boards and sign language. Journal of Autism and Childhood Schizophrenia, 1973, 3, 65-85.

Moore, M. V. Binary communication for severely handicapped. Arch. Phys. Med. Rehab., 1972, 53, 532-533.

Reichle, J. E. and Yoder, D. E. Communication Behavior for the Severely and Profoundly Mentally Retarded: Assessment and Early Stimulation Strategies. In York, R. and Edgar, E. Teaching the Severely Handicapped Volume IV, New York: Grune & Stratton (in press).

Risley, T. and Wolf, M. Establishing functional speech in echolalic children. Behav. Res. and Therapy, 1967, 5, 73-88.

Scheifelbusch, R. and Lloyd, L. L. Language Perspectives: Acquisition, Retardation and Intervention. Baltimore: University Park Press (1974).

Seitz, S. and Hoekenga, R. Modeling as a training tool for retarded children and their parents Mental Retardation, 1974, 12, 28-31.

Smith, D. and Smith, S. Michigan Language Program. Random House Inc.

Sontag, Smith, and Certo (Eds.). Educational programming for the severely and profoundly handicapped. Special Publication of the Division on Mental Retardation, The Council for Exceptional Children (1977).

Stremel, K. and Waryas, C. A behavioral-psycholinguistic approach to language training. American Speech and Hearing Monographs, 1974, 18, 96-124.

Tawney, J. W. and Hispsher, L. Systematic instruction for retarded children. The Illinois Program. Experimental Edition: Part II. Systematic Language Instruction. Danville, Illinois: The Interstate Printers and Publishers, (1972).

Topper, S. T. Gesture language for a nonverval severely retarded male. Mental Retardation, 1975, 13, 30-31.

Vanderheiden, D. H., Brown, W. P., MacKenzie, P., Reinen, S., and Schiebel, C. Symbol communication for the mentally handicapped. Mental Retardation, 1975, 13, 34-37.

Vanderheiden, G. C. and Grilley. Non-Vocal Communication Techniques and Aids for the Severely Physically Handicapped. Baltimore: University Park Press (1976).

Yoder, D. E. and Reichle, J. E. Some Current Perspectives on Teaching Communication Functions to Mentally Retarded Children. In Mittler, P. (Ed.) Research to Practice in Mental Retardation: Volume II Education and Training. Baltimore: University Park Press (in press).

References

Some Current Topics

Ainsworth, M. and Wittig, B. Attachment and exploratory behavior of one-year-olds in a strange situation. In B.M. Foss (ed). Determinents of Infant Behavior, 4. London: Methuen, 1969.

Bates, E. Language and Context. The Acquisition of Pragmatics. New York: Academic Press, 1976.

Bates, E., Benigni, L., Bretheton, I., Canaioni, L., and Voltera, V. From gesture to the first word: On cognitive and social prerequisites. In Lewis, M. and Rosenblum, L. (eds). Interaction, Conversations, and the Development of Language. New York, Jon Wiley, 1977.

Bell, S. and Ainsworth, M. Infant crying and maternal responsiveness: Reinforcement reassessed. Unpublished manuscript, 1971.

Bertenthal, B.I. and Fisher, K. Development of Self Recognition in the Infant Development. Psych. 1978, 14, 44-50.

Bloom, K. Patterning of infant vocal behavior. Of Experimental Child Psychology, 1977, 23, 367-377.

Bloom, L., Hood, L., and Lightbown, P. Imitation in Language Development: If When and Why. Cognitive Psychology, 1974, 6, 380-420.

Bowlby, J. Attachment and Loss. Vol. 1, London: Hogarth Press, 1969.

Braxelton, T.B., Koslowski, B., and Main, M. The origins of reciprocity. The early mother-infant interaction. In Lewis and Rosenblum (eds). The Effect of the Infant on its Caregiver. Wiley, New York, 1974.

Brazelton, T.B., Tronick, E., Adamson, C., Als, H. and Wise, S. Early Mother-Infant Reciprocity in Parent-Infant Interactions. Elsevier, Amsterdam, 1975.

Brazelton, T.B., Tronick, E., Adamson, C., Als, H. and Wise, S. Early mother-infant reciprocity. In M.A. Hofer (ed). The Parent-Infant Relationship. Summit, N.J.: Chemical Industries of Basil Associated Foundation, 1975.

Browne, G.Y. Discrimination of normative facial expressions by 12-week-old infants. Proceedings of Meeting of the Society for Research in Child Development, 1975.

Bruner, J. The ontogenesis of speech acts. Journal of Child Language, 1975, 2, 1.

Bruner, J. and Sherwood, V. The game of peekaboo: Unpublished, Oxford, 1974.

Call, D.J. and Marschak, M. Styles and games in infancy. Journal of the American Academy of Child Psychiatry, 1966, 5, 193-211.

Carpenter, G.C. Mother-stranger discrimination in the early weeks of life. Proceedings of Meeting of the Society of Research in Child Development, 1973.

Carter, A. The transformation of sensorimotor morphemes into words: A case study of the development of more and mine. Journal of Child Language, 1975, 2.

Carter, A. The development of systematic vocalizations prior to words. A case study. In N. Waferson and Ci Snow (eds). Development of Communication, Social, and Pragmatic Factors in Language Acquisition. New York, Wiley.

631

Chapman, R. Comprehension strategies in children. In J. Kavenagh, W. Strange (eds). Implications of Basic Speech and Language Research for the School and Clinic, 1977.

Chapman, R. Discussion summary-developmental relationship between receptive and expressive language. In R.L. Schiefelbusch and L.L. Lloyd (eds). Language Perspectives, Acquisition, Retardation and Intervention. Baltimore: University Park Press, 1974.

Clark, E.V. What's in a word? On the child's acquisition of semantics in his first language. In T.E. Moore (ed). Cognitive Development and the Acquisition of Language. New York: Academic Press, 1973. pp. 65-110.

Coggins, T. Early semantic development in retarded children. Unpublished doctoral dissertation, University of Wisconsin, 1976.

Condon, W.S. and Sander, L.W. Neonate movement is synchronized with adult speech: Interactional participation and language acquisition. Science, 1974, 183, 99-101.

Condon, W.S. and Sander, L.W. Speech interactional participation and language acquisition. Science, New York, 1974, 183, 99-101.

Condon, W.S. and Sander, L.W. Synchrony demonstrated between movements of the neonate and adult speech. Child Development, 1974, 43, 456-462.

Corrigan, R. Patterns of Individual Communication and Cognitive Development. Unpublished doctoral dissertation. University of Denver, 1976.

Crawley, S., Rogers, P., Friedman, S. et. al. Developmental Changes in the Structure of Mother-Infant Play. Developmental Psychology, 1978, 14 30-36.

Cromer, R. The cognitive hypothesis of language acquisition and its implications for child language deficiency. In D. Morehead and A. Morehead (eds). Normal and Deficient Child Language, Baltimore: University Park Press, 1976.

Davison, A. Linguistic play and language acquisition. In papers and reports on child language development. Special Issue. Sixth Child Language Research Forum, 1974.

Dore, J. A pragmatic description of early development. Journal of Psycholinguistic Research, 1974, 3, 343-350.

Dunn, J.F. Consistency and change in maternal style. In M. O'Connor (ed). The Parent-Infant Relationship. London: Academic Press, 1974.

Edwards, D. Sensorimotor intelligence and semantic relations in early child grammar. Cognition, 1973, 2, 395-434.

Garvey, C. Some properties of social play. Merrill Palmer Quarterly, 1974, 20, 1963-180.

Garvey, C. Requests and responses in children's speech. Journal of Child Language 1975, 2, 41-63.

Garvey, C. Play with language and speech. In S. Ervin-Tripp and C. Mitchell-Kerran (eds). Child Discourse, Academic Press, New York, 1977.

Greenfield, P. and Smith, J. The structure of Communication in Early Language Development. Academic Press, New York, 1976.

Guess, D., Sailor, W. and Baer, D. A behavioral-remedial approach to language training for the severely handicapped. In E. Sortag, J. Smith and N. Certo (eds). Educational Progressing for the Severely and Profoundly Handicapped. Special publication of the Division on Mental Retardation, The Council for Exceptional Children, 1977.

Huttenlocher, J. The origins of language comprehension. In Ril. Solso (ed). Theories of Cognitive Psychology. Lawrence Cribaum Association, 1974.

Ingram, D. Language Development and the Sensorimotor Period. Paper presented to the third international child language symposium. London, September, 1975.

Inhelder, B. Cognitive development and its contribution to the diagnosis of some phenomena of mental deficiency. Merrill Palmer Quarterly, 1969, 12, 299-319.

Jackson, E., Campos, J., and Fischer, K.W. The question of decalage between object permanence and person permanence. Developmental Psychology, 1978, 14, 1-10.

Jaffe, J., Stern, D.N., and Perry, J.C. 'Conversational' coupling of gaze behavior in prelinguistic human development. Journal of Psycholinguistic Research, 1973, 2, 321-329.

Kahn, J.V. Relationship of Piaget's sensorimotor period to language acquisition of profoundly retarded children. American Journal of Mental Deficiency, 1975, 79, 640-643.

Kaye, K. Gaze direction as the infant's way of controlling his mother's teaching behavior. Proceedings of Meeting of the Society for Research in Child Development, 1975.

Kaye, K. and Brazelton, T.B. Mother-infant interaction in the organization of sucking. Proceedings of Meeting of the Society for Research in Child Development, 1971.

Kaye, K. Toward the Origin of Dialogue. Paper presented to the Loch Lomond Symposium. University of Strabclyde, September, 1975.

Lackner, J.R. A developmental study of language behavior in retarded children. Neuropsychologia, 1968, 6, 301-320.

Lamb, M. A re-examination of the infant social world. Human Development, 1977, 20, 65-85.

Lamb, M.E. The one-year-old's interaction with its parents. Proceedings of the Meeting of the Eastern Psychological Association, 1976.

Lamb, M.E. Interactions between eight-month-old children and their fathers and mothers: In Lamb, The Role of the Father in Child Development, Wiley, New York, 1976.

Lewis, M. and Freedle, R. Mother-infant dyad: The cradle of meaning: In Pliner, Krames and Alloway. Communication and affect: Language and thought, Academic Press, New York, 1973.

Lewis, M.M. Infant Speech: A Study of Beginnings of Language. London: Routledge & Kegan, Paul, 1936.

Lynch, V., Shoemaker, S., White, O. Training needs survey. The American Association for the Education of the Severely/Profoundly Handicapped, 1976, 1, 1-16.

McLean, J. and Snyder, L. A transactional approach to early language training: Derivation of a model system. Final Report, Contract No. OEC-0-74-9185. Washington, D.C.: U.S. Office of Education, BEH, 1976.

MacNamara, S. The cognitive basis of language learning in infants. Psychological Review, 1972, 79, 1-73.

Miller, J., Reichle, J., and Branston, M. Assessment of communicative development in the young communicative child. Unpublished manuscript, University of Wisconsin, Madison, Wisconsin, 1977.

Moore, M. and Meltzoff, A. Neonate imitation: A test of existence and mechanism. Paper presented at biennial meeting of the Society for Research in Child Development, Denver, Colorado, April, 1975.

Northern, J. and Downes, M.P. Hearing in Children. Baltimore: Williams and Wilkins, 1974.

Richards, M. and Bernal, J.R. An observational study of mother-infant interaction. In N. Blurton Jones (ed). Ethological Studies in Child Behavior. London: Cambridge University Press, 1972.

Rodgin, M. and Kurdex, L. Vocal and gestural imitation in 8-14 and 20 month olds. Of Genetic Psychology, 1977, 131, 115-123.

Rubenstein, J. Maternal attentiveness and subsequent exploratory behavior. Child Development, 1967, 38, 1089-1100.

Ryan, J. Early language development: Towards a communicational analysis. In M. Richards (ed). The Integration of a Child into a Social World. ondon & New York: Cambridge University Press, 1974, pp. 182-215.

Sagi, A. and Hoffman, M.L. Empathic distress in the newborn. Developmental Psychology, 1976, 12, 175-176.

Sander, L.W. Infant and caretaking environment: Investigation and conceptualization of adaptive behavior in a system of increasing complexity. In E.J. Anthony (ed). Explorations in Child Psychiatry. New York: Plenver Press, 1975.

Shields, M. Cognition and Communication in the Acquisition of Language. Paper presented to the third international child language symposium, London, September, 1975.

Sidman, M. Tactics of Scientific Research, New York: Basic Books, 1960.

Soltman, S. and Tieke, J. Communication management for the non-responsive child: A team approach. In E. Sontag, J. Smith and N. Certo (eds). Educational Programming for the Severely and Profoundly Handicapped. Special publication of the Division on Mental Retardation, The Council for Exceptional Children, 1977.

Stechler, G. and Carpenter, G. A viewpoint on early affective development. In J. Hellmuth (ed). Exceptional Infant. Vol. 1, New York: Bruner/Mazel 1967, pp. 163-189.

Stechler, G. and Latz, E. Some observations on attention and arousal in the human infant. Journal of the American Academy of Child Psychiatry, 1966, 5, 517-525.

Stern, D. Mother and infant at play: The dyadic interaction involving facial, vocal and gaze behaviors. In Lewis and Rosenblum (eds). The Effect of the Infant on its Caregiver. Wiley, New York, 1974.

Sugarman, S. A Description of Communicative Development in the Prelanguage Child. Honors Thesis, ampshire College, 1973.

Thoman, E. Sleep and wake patterns in neonates: Consistencies and consequences. Merrill Palmer Quarterly, 1975. 21, 295-314.

Uzgiris, I.C. and Hunt, J. McV. Assessment in Infancy: Orderal Scales of Psychological Development, Champaign: University of Illinois Press, 1975.

Wachs, T. Utilization of a piagetiam approach in the investigation of early experience effects: A research strategy and some illustrative data. Merrill Palmer Quarterly, 1976, 22, 11-30.

Weif, K. Language in the Crib. The Hague: Mooton, 1962.

White, B.L. Critical influence in the origins of competence. Merrill Palmer Quarterly, 1975, 21, 243-266.

Audiological References

Allyon, T. and Azrin, N.H., "The Measurement and Reinforcement of Behavior of Psychotics," J. of Exper. Analys. of Behav., 1965, 8, 357-383.

Anderson, R., "An auditory Conditioning Program," Unpublished paper for workshop presentation, Teaching Research Division, Oregon State System for Higher Education, Monmouth, OR, 1974.

Brandy, W., "Reliability of Voice Tests of Speech Discrimination," J. Spch. Hrg. Res., 1966, 9, 461-465.

Bricker, D.D. and Bricker, W.A., "A Programmed Approach to Operant Audiometry for ow-Functioning Children," J. Spch. Hrg. Dis., 1969, 35:4, 312-320.

Caplan, F., The First Twelve Months of Life: Your Baby's Growth Month by Month, New York: Grosset & Dunlap, 1973.

Carhart, R. and Jerger, J., "Preferred Method for Clinical Determination of Pure-Tone Thresholds," J. Spch. Hrg. Dis., 1959, 24:330-345.

Cowles, J.T., "Food Tokens as Incentives for Learning for Chimpanzees," Comp. Psych. Mono., 1937, 14, 1-96.

Cox, J., "How Quiet Must it Be to Measure Hearing?," Noise Control, 1955, 1, 25-29.

Davis, H., Mast, T., Yoshire, N., and Zerlin, S., "The Slow Response of the Human Cortex to Auditory Stimuli: Recovery Process," Electroencephalog. and Clin. Neurophysiol., 1966, 21, 105-113.

Downs, M.P. and Sterritt, G.H., "A Guide to Newborn and Infant Hearing Screening Programs," Arch. Otolaryng., 1967, 85, 15-22.

Eisele, W.A., Berry, R.C., and Shriner, T.H., "Infant Sucking Response Patterns as a Conjugate Function of Changes in the Sound Pressure Level of Auditory Stimuli," J. Spch. Hrg. Res., 1975, 18, 296-307.

Eisenberg, R., Auditory Competence in Early Life: the Roots of Communicative Behavior, Baltimore, Md.: University Park Press, 1976.

Eisenberg, R., Griffin, E.J., Coursin, D.B., and Hunter, M.A., "Auditory Behavior in the Human Neonate: a Preliminary Report," J. Spch. Hrg. Res., 1964, 7, 245-269.

Ewing, Sir A.W.G. and Ewing, I.R., "Ascertainment of Deafness in Infancy and Early Childhood," J. Laryngol., 1944, 5, 309-333.

Friedlander, B.Z., "Automated Playtest Systems for Evaluating Infants' and Young Children's Selective Listening to Natural Sounds and Language," Scientific exhibit, ASHA convention, Chicago, 1969.

Fulton, R.T., Gorzycki, P.A., and Hall, W.L., "Hearing Assessment with Young Children," J. Spch. Hrg. Dis., 1975, 40, 397-404.

Graham, F.K., "Habituation and Dishabituation of Responses Innervated by the Autonomic Nervous System." In H.V.S. Peeke and M.J. Herz (eds). Habituation: Behavioral Studies and Physiological Substrates, pp. 163-218, New York, N.Y.: Academic Press, Inc., 1973.

Hecox, K., "Electrophysiological Coorelates of Human Auditory Development," In Cohen, L.B. and Salapatek, P. (eds). Infant Perception: from Sensation to Cognition, Vol. II, New York, N.Y.: Academic Press, 1975.

Hedrick, D., Kemp, J. and Thompson, M., Communication Programs for the Multi-Handicapped, Deaf-Blind Child. Research Grant, Contract No. 2258-CGG-3832, DSHS, State of Washington, under provisions of PL 91-230, Part C, BEH Publication.

Holland, J.G. and Skinner, B.F., The Analysis of Behavior, New York, N.Y.: McGraw-Hill, 1961. (Programmed Text)

Hoverston, G. and Moncur, J. "Stimuli and Intensity Factors in Testing Infants," J. Spch. Hrg. Res., 1969, 12, 687-702.

Kendler, H.H. and Kendler, T.S., Basic Psychology: Brief Edition, New York, N.Y.: Meredith Corp., 1971.

Ling, D., "Acoustic Stimulus Duration in Relation to Behavioral Responses of Newborn Infants," J. Spch. Hrg. Res., 1972, 15, 567-571.

Ling, D., Ling, A.H. and Doehring, D.G., "Stimulus, Response and Observer Variables in the Auditory Screening of Newborn Infants," J. Spch. Hrg. Res., 1970, 13, 9-18.

Merrill, H. and Atkinson, C., "The Effect of Selected Variables Upon Speech Discrimination Scores," Journal of Auditory Research, 1965, 5, 285-292.

Moncur, J. "Judge Reliability in Infant Testing," J. Spch. Hrg. Res., 1968, 11, 348-357.

Moore, J.M., Thompson, G. and Thompson, M., "Auditory Localization of Infants as a Function of Reinforcement Conditions," J. Spch. Hrg. Dis., 1975, 40:1, 29-34.

Moore, J.M., Wilson, W.R., and Thompson, G., "Visual Reinforcement of Head Turn Responses in Infants Under Twelve Months of Age," J. Spch. Hrg. Dis., 1977 42:3, 328-334.

Northern, J. and Downs, M.P., Hearing in Children, Baltimore, Md.: Williams and Wilkin, 1974.

Rapin, I. and Steinherz, R., "Reaction Time for Pediatric Audiology," J. Spch. Hrg. Res., 1970, 13, 203-217.

Robinson, A. and Hendley, M., "Some Aspects of the Effect of Stress on the Performance of Brain-Injured Children," unpublished paper, City of Manchester Eval. Committee; Margaret Barclay Residential School for Physically Handicapped Children; Mobberly Hall; Mobberly, Cheshire, England, 1973.

Sanders, J.W., and Josey, A.F., "Narrow Band Noise Audiometry for Hard-to-Test Patients," J. Spch. Hrg. Res., 1970, 13, 74-81.

Sheridan, M.D., "Manual for the STYCAR Hearing Test," Mere, Upton, Park, Slough, Buchs: Nat'l Foundation for Ed. Research in England and Wales, 1957.

Sutton, S., Tueting, P., Zubin, J., and John, E.R., "Information Delivery and the Sensory Evoked Potential," Science, 1967, 155, 1436-1439.

Suzuki, T. and Sat, I., "Free Field Startle Response Audiometry: A Quantitative Method for Determining Hearing Threshold of Infant Children," Ann. Ots. Rhin. and Laryng., 1961, 70, 997-1007.

Suzuki, T. and Ogiba, Y., "Conditioned Orientation Reflex Audiometry," Arch. Otolaryng., 1961, 74, 192-198.

Thompson, M. and Thompson, G., "Responses of Infants and Young Children as a Function of Auditory Stimuli and Test Methods," J. Spch. Hrg. Res., 1972, 15, 699-707.

Thompson, G. and Weber, B., "Responses of Infants and Young Children to Behavioral Observation Audiometry (BOA)," J. Spch. Hrg. Dis., 1974, 39, 140-147.

Walton, W.K. and Wilson, W.R., "Identification Audiometry in the Schools -- a Preliminery Evaluation of Recommended Procedure," Washington State Spch. and Hrg. Convention, Ellensburg, Wash. November, 1972.

Watrous, B.S., McConnell, F., Sitton, A.B., and Fleet, W.F., "Auditory Responses of Infants," J.Spch. Hrg. Dis., 1975, 40:3, 357-366.

Weber, B., "Validation of Observer Judgements in Behavioral Observation Audiometry," J. Spch. Hrg. Dis., 1969, 34:4, 350-355.

Whaley, D.L. and Mallott, R.W., Elementary Principles of Behavior, New York, N.Y.: Meredith Corp., 1971.

Wilson, W.R., "Sensory Assessment: Auditory Behavioral Assessment of Auditory Function in Infants," to appear in: Minifie, F.D. and Lloyd, L.L., (eds). Communicative and Cognitive Abilities -- Early Behavioral Assessment. Baltimore, Md.: University Park Press, In press, 1977.

Wilson, W.R., Moore, J.M., and Thompson, G., "Auditory Thresholds of Infants Utilizing Visual Reinforcement Audiometry," Submitted for publication, 1976.

Zwislocki, J., "Theory of Temporal Summation," J. Acoust. Soc. Amer., 1960, 32, 1046-1060.

Amary, I. Creative Recreation for the Mentally Retarded. Springfield, Illinois. Charles C. Thomas, 1975.

Barnes, K. Preschool play norms: a replication. Developmental Psychology, 1971, 5, 99-103.

Bayley, N. Bayley Scales of Infant Development. The Psychological Corporation, New York, New York.

Bradtke, L., Kirkpatrick, W., and Rosenblatt, K. Intensive play - a technique for building effective behaviors in profoundly mentally retarded young children. Education and Training of Mentally Retarded, 1972, 1, 8-13.

Brown, L., Crowner, T., Williams, W. W. and York, R. Madison's Alternative for Zero Exclusion: A Book of Readings. Madison, Wisconsin, Madison Public Schools, 1975.

Cooke, T. and Apolloni, T. Developing positive social-emotional behaviors: a study of training and generalization. Journal of Applied Behavior Analysis, 1976, 9, 65-78.

Daniels, A. and Davies, G. Adapted Physical Education. New York: Harper and Row, 1975.

DiNola, A., Kaminsky, B., Sternfeld, A. TMR Performance Profile for the Severely and Moderately Retarded, 1970.

Doll, E. Vineland Social Maturity Scale, American Guidance Service, Inc. Circle Pines, Minnesota, 1970.

Edginton, C. and Hayes, G. Using performance objectives in the delivery of therapeutic recreation services. Journal of Leisureability, 1976, 3, 20-26.

Favell, J. and Cannon, P. An evaluation of entertainment materials for severely retarded persons. American Journal of Mental Deficiency, 1977, 81, 357-362.

Frankenburg, W., Dodd, J. and Fandal. Denver Developmental Screening Test. The LaDoca Company.

Gibson, F., Lawrence, P., and Nelson, R. Comparison of three training procedures for teaching social responses to developmentally disabled adults. American Journal of Mental Deficiency, 1977, 81, 379-387.

Griffin, P. M. and Sanford, A. R. Lap I - Learning Accomplishment Profile for Infants. Kaplan School Supply Corporation, Winston-Salem, North Carolina.

Kamii, C. Preschool education: Socio-emotional, perceptual-motor and cognitive. In B. M. Bloom et al. (eds.) Handbook on Formative and Summative Evaluation of Student Learning. New York: McGraw-Hill, 1971.

Knapczgk, D. and Yoppi, J. Development of cooperative and competitive play responses in developmentally disabled children. American Journal of Mental Deficiency, 1975, 80, 245-255.

Koontz, C. Koontz Child Developmental Program: Training Activities for the First Forty-eight (48) Months. Western Psychological Services, Los Angeles, California, 1976.

Lezinc, I. The transition from sensorimotor to earliest symbolic function in early development. Early Development, 1973, 51, 221-228.

Nihira, K., Foster, R., Shellhaas, M., Leland, H. AAMD Adaptive Behavior Scales. Washington: American Association on Mental Deficiency, 1974.

Piaget, J. Play, Dreams and Imitation. New York: Norton, 1962.

Quillitch, H. and Risley, T. The effects of play materials on social play. Journal of Applied Behavior Analysis, 1973, 6, 573-578.

Raph, J. and Nicolich, L. Emergence of symbolic in play and language. Paper presented at APA, Chicago, 1975.

Singer, J. and Singer, D. Imaginative play and pretending in early childhood; Some experimental approaches. In A. Davids (ed.) Child Personality and Psychopathology. New York: Wiley, 1976.

Sailor, W. and Mix, B. The TARC Assessment System. H & H Enterprises, P.O. Box 3342.

Stillman, R. Callier-Azusa Scale. Collier Center for Communicative Disorders, Dallas, Texas, 1974.

Strain, P. Increasing social play of severely retarded preschoolers through sociodramatic activities. Mental Retardation, 1975, 13, 7-9.

Thiagarajau, S. Designing instructional games for handicapped learners. Focus on Exceptional Children, 1976, 7.

Uzgiris, I. C. and Hunt, J. M. Assessment in Infancy: Ordinal Scales of Psychological Development. Urbana: University of Illinois Press, 1975.

Wehman, P. Establishing play behaviors in mentally retarded youth. Rehabilitation Literature, 1975, 36, 238-256.

Wehman, P. A leisure time activities curriculum for developmentally disabled. Education and Training of the Mentally Retarded, 1976, 11, 309-313.

Wehman, P. Selection of play materials for the severely handicapped: a continued dilemma. Education and Training of the Mentally Retarded, 1976, 11, 46-51.

Wehman, P. Helping the Mentally Retarded Acquire Play Skills: A Behavioral Approach. Springfield, Illinois: Charles C. Thomas, 1977.

Wehman, P. Recreation Programming for Developmentally Disabled Persons. Baltimore, Maryland: University Park Press, 1979.

Selected References in Vocational Training for the Severely Handicapped

Abel, T. M. The influence of social facilitaton on motor performance at different levels of intelligence. American Journal of Psychology, 1938, 51, 379-389.

Bateman, S. Application of Premack's generalization on reinforcement to modify occupational behavior in two severely retarded individuals. American Journal of Mental Deficiency, 1975, 79, 604-610.

Becker, W. C. Teaching concepts and operations, or how to make kids smart. In W. C. Becker (Ed.), An Empirical Basis for Change in Education: Selections on Behavioral Psychology for Teachers. Chicago, Illinois: Science Research Associates, Inc., 1971.

Bellamy, T. (Ed.) Habilitation of severely and profoundly retarded adults. Eugene, Oregon: Center on Human Development, 1976.

Dellamy, T. Pterson, L. & Close, D. Habilitation of the severely and profoundly retarded: Illustrations of competence. Education and Training of the Mentally Retarded, 1975, 10, 174-186.

Bellamy, T., & Snyder, S. The trainee performance sample: Toward the prediction of habilitation costs for severely handicapped adults. AAESPH Review, 1976, 1 (4), 17-36.

Bellamy, T., & Sontag, E. Use of group contingent music to increase assembly line production rates of retarded students in a simulated sheltered workshop. Journal of Music Therapy, 1973, 10, 125-136.

Brown, L., Johnson, S., Gadberry, E., & Fenrick, N. Increasing individual and assembly line production rates of retarded students. Training School Bulletin, 1971, 67, 206-213.

Brown, L., Nietupski, J., & Hamre-Nietupski, S. The Criterion of Ultimate Functioning and Public School Services for Severely Handicapped Students. Madison, Wisconsin: University of Wisconsin and Madison Public Schools, 1976.

Brown, L., & Pearce, E. Increasing the production rates of trainable retarded students in a public school simulated workshop. Education and Training of the Mentally Retarded, 1970, 5, 15-22.

Brown, L., Van Deventer, P., Perlmutter, L., Jones, S., & Sontag, E. Effects of consequences on production rates of trainable retarded and severely emotionally disturbed students in a public school workshop. Education and Training of the Mentally Retarded, 1972, 7, 74-81.

Chaffin, J. D. Production rate as a variable in the job success or failure of educable mentally retarded adolescents. Exceptional Children, 1969, 35, 533-538.

Christensen, N. A., DuBois, P. A., & Austin, M. Selected Bibliography for Vocational Training and Placement of the Severely Handicapped. Palo Alto, California: American Institutes for Research, 1975.

Claridge, G. S., & O'Connor, N. The relationship between incentive, personality type and improvment in performance of imbeciles. Journal of Mental Deficiency Research, 1957, 1, 16-25.

Clarke, A., & Heremelin, F. Adult imbeciles: Their abilities and trainability. The Lancet, 1955, 2. 337-339.

Cobb, H. V. Predictive Assessment of the Adult Retarded for Social and Vocational Adjustment: A Review of Research (Part II). Vermillion, South Dakota: University of South Dakota, Department of Psychology, 1969.

Cotter, V. W. Effects of music on performance of manual tasks with retarded adolescent females. American Journal of Mental Deficiency, 1971, 76, 242-248.

Crosson, J. E. The Experimental Analysis of Vocational Behavior in Severely Retarded Males. Unpuglished doctoral dissertation, University of Oregon, 1966.

Crosson, J. E. The functional analysis of behavior: A technology for special education practices. Mental Retardation, 1960, 7 (4), 15-19.

DeBriere, T. Meaningful Institutional Training. Paper presented at the American Association on Mental Deficiency Annual Convention, Chicago, Illinois, June 1976.

Federal Register, Chapter V, Part 525: Employment of Handicapped Clients in Sheltered Workshops May 17, 1974, p. 17509.

Friedenberg, W. P., & Martin, A. S. Prevocational training using task analysis. In A. S. Martin & R. W. Flexer (Eds.), Three Studies on Training Work Skills and Work Adjustment with the Severely Retarded (Monograph No. 5). Lubbock, Texas: Texas Tech University, Research and Training Center in Mental Retardation, 1975.

Gold, M. W. Redundant cue removal in skill training for the retarded. Education and Training of the Mentally Retarded, 1974, 9 (1), 5-8.

Gold, M. W. Remarks on Goal-Related Research Needs in the Education of the Severely Handicapped. Conference on Research Needs Related to the Education of the Severely Handicapped. Princeton, New Jersey: Educational Testing Service and Bureau of Education for the Handicapped, 1975.

Gold, M. W. Research on the vocational habilitation of the retarded: The present, the future. In N. Ellis (Ed.), International Review of Research in Mental Retardation (Vol. 6). New York: Academic Press, 1973.

Gold, M. W. Stimulus factors in skill training of the retarded on a complex assembly task: Acquisition, transfer and retention. American Journal of Mental Deficiency, 1972, 76, 517-526.

Gold, M. W., & Barclay, C. R. The effects of verbal labels on the acquisition and retention of a complex assembly task. Training School Bulletin, 1973, 70, 39-43. (a)

Gold, M. W., & Barclay, C. R. The learning of difficult visual discriminations by the moderately and severely retarded. Mental Retardation, 1973, II (2), 9-11. (b)

Gordon, S. The rate of improvement of adult imbeciles on a manual dexterity task as compared with high grade defectives. In B. W. Richards (Ed.), Proceedings of the London Conference on the Scientific Study of Mental Deficiency (Vol. 2). Dagenham, England: May & Baker Ltd., 1962.

Gordon, S., O'Connor, N., & Tizard, J. Some effects of incentives on the performance of imbeciles. American Journal of Mental Defiency, 1955, 60, 371-377.

Gordon, S., O'Connor, N., & Tizard, J. Some effects of incentives on the performance of imbeciles. British Journal of Psychology, 1954, 45, 277-287.

Greene, R. J., & Hoats, D. L. Reinforcing capabilities of television distortion. Journal of Applied Behavior Analysis, 1969, 2, 139-141.

Helland, C., Paluck, R. J., & Klein, M. A comparison of self and external reinforcement with the trainable mentally retarded. Mental Retardation, 1976, 14 (5), 22-24.

Hollis, J. H. Effects of reinforcement shifts on bent-wire performance of severely retarded children. American Journal of Mental Deficiency, 1967, 69, 531-535.

House, B. J., & Zeaman, D. Approach and avoidance in the discrimination learning of retardates. Child Development, 1960, 33, 355-372.

Huddle, D. Work performance of trainable adults as influenced by competition, cooperation, and monetary reward. American Journal of Mental Deficiency, 1967, 72, 198-211.

Hunter, J., & Bellamy, T. Cable harness construction for severely retarded adults: A demonstration of training technique. In T. Bellamy (Ed.), Habilitation of the Severely and Profoundly Retarded: Reports from the Specialized Training Program. Eugene, Oregon: University of Oregon Center on Human Development, 1976.

Irvin, L. General utility of easy-to-hard discrimination training procedures. In T. Bellamy (Ed.) Habilitation of Severely and Profoundly Retarded Adults. Eugene, Oregon: University of Oregon, 1976.

Irvin, L., & Bellamy, T. Manipulation of stimulus features in vocational skill training of the severely retarded: Relative efficacy. In T. Bellamy (Ed.), Habilitation of the Severely and Profoundly Retarded: Reports from the Specialized Training Program. Eugene, Oregon: University of Oregon Center on Human Development, 1976.

Jens, K. G., & Shores, R. E. Behavioral graphs as reinforcers for work behavior of mentally retarded adolescents. Education and Training of the Mentally Retarded, 1969, 4, 21-26.

Kahn, H., & Burdett, A. D. Interaction of practice and rewards on motor performance of adolescent mental retardates. American Journal of Mental Deficiency, 1967, 72, 422-427.

Karan, O. C., Wehman, P., Renzaglia, A., & Schutz, R. Habilitation Practices with the Severely Developmentally Disabled. Madison, Wisc.: University of Wisconsin, Rehabilitation Research and Training Center, 1976.

Karen, R. L., Eisner, M., & Endres, R. W. Behavior modification in a sheltered workshop for severely retarded students. American Journal of Mental Deficiency, 1974, 79, 338-347.

Kliebhan, J. M. Effects of goal-setting and modeling on job performance of retarded adolescents. American Journal of Mental Deficiency, 1967, 72, 220-226.

Levy, J. Social reinforcement and knowledge of results as determinants of motor performance among EMR children. American Journal of Mental Deficiency, 1974, 78, 752-758.

Levy, S. M. The development of work skill training procedures for the assembly of printed circuit boards by the severely handicapped. AAESPH Review, 1975, 1 (1), 1-9.

Lindsley, O. Direct measurement and prosthesis of retarded behavior. Journal of Education, 1964, 62-81.

Loos, F. M., & Tizard, J. The employment of adult imbeciles in a hospital workshop. American Journal of Mental Deficiency, 1955, 59, 395-403.

Martin, A. S., & Flexer, R. W. Three Studies on Training Work Skills and Work Adjustment with the Severely Retarded (Monograph No. 5). Lubbock, Texas: Texas Tech University, Research and Training Center in Mental Retardation, 1975.

Meyerson, L., Michael, J. L., Mower, O. H., Osgood, C. E., & Staats, A. W. Learning, behavior, and rehabilitation. In R. Lofquist (Ed.), Psychological Research and Rehabilitation. Washington, D. C.: American Psychological Association, 1960, p. 68-111.

Podvin, M. G. The influence of music on the performance of a work task. Journal of Music Therapy, 1967, 4, 52-56.

Renzaglia, A., Wehman, P., Schutz, R., & Karan, O. Use of cue redundancy and positive reinforcement to accelerate production rates in two profoundly retarded workers. British Journal of Social and Clinical Psychology, in press.

Schroeder, S. Parametric effects of reinforcement frequency, amount of reinforcement, and required response force on sheltered workshop behavior. Journal of Applied Behavior Analysis, 1972, 5, 431-441.

Screven, C. G., & LaFond, R. J. An application of an avoidance procedure to a sheltered workshop. The Psychological Record, 1973, 23, 13-16.

Screven, C., Straka, J., & LaFond, R. Applied behavioral technology in a vocational rehabilitation setting. In W. Gardner, Behavior Modification in Mental Retardation. Chicago: Aldine, 1971.

Sidman, M., & Stoddard, L. The effectiveness of fading in programming a simultaneous form discrimination for retarded children. Journal of the Experimental Analysis of Behavior, 1967, 10, 3-15.

Teasdale, R., & Joynt, D. Some effects of incentives on the behavior of adolescent retardates. American Journal of Mental Deficiency, 1967, 71, 925-930.

Tramontana, J. Social versus edible rewards as a function of intellectual level and socioeconomic class. American Journal of Mental Deficiency, 1972, 77, 33-38.

Trybus, R. J., & Lacks, P. B. Modification of vocational behavior in a community agency for mentally retarded adolescents. Rehabilitation Literature, 1972, 33 (9), 258-266.

Watson, L., Orser, R., & Sanders, C. Reinforcement preferences of severely mentally retarded children in a generalized reinforcement context. American Journal of Mental Deficiency, 1967, 72, 748-756.

Wehman, P. Toward a social skills curriculum for developmentally disabled clients in vocational settings. Rehabilitation Literature, 1975, 36, 342-348.

Wehman, P. Vocational training of the severely retarded: expectations and potentials. Rehabilitation Literature, 1976, 37 (8), 233-236.

Wehman, P., Renzaglia, A., & Schutz, R. Behavioral training strategies in sheltered workshops for the severely developmentally disabled. AAESPH Review, 1977, 2 (1), 24-31.

Wehman, P., Schutz, R., Renzaglia, A., & Karan, O. C. The use of positive practice training in work adjustment with two profoundly retarded workers. Vocational Evaluation and Work Adjustment, 1977, 10 (3).

Wehman, P., Schutz, R., Bates, P., Renzaglia, A., & Karan, O. Self-management programs with mentally retarded workers. Implications for developing independent vocational behavior. British Journal of Social and Clinical Psychology, 1977, 16 (3).

Williams, P. Industrial training and remunerative employment of the profoundly retarded. Journal of Mental Subnormality, 1967, 13, 14-23.

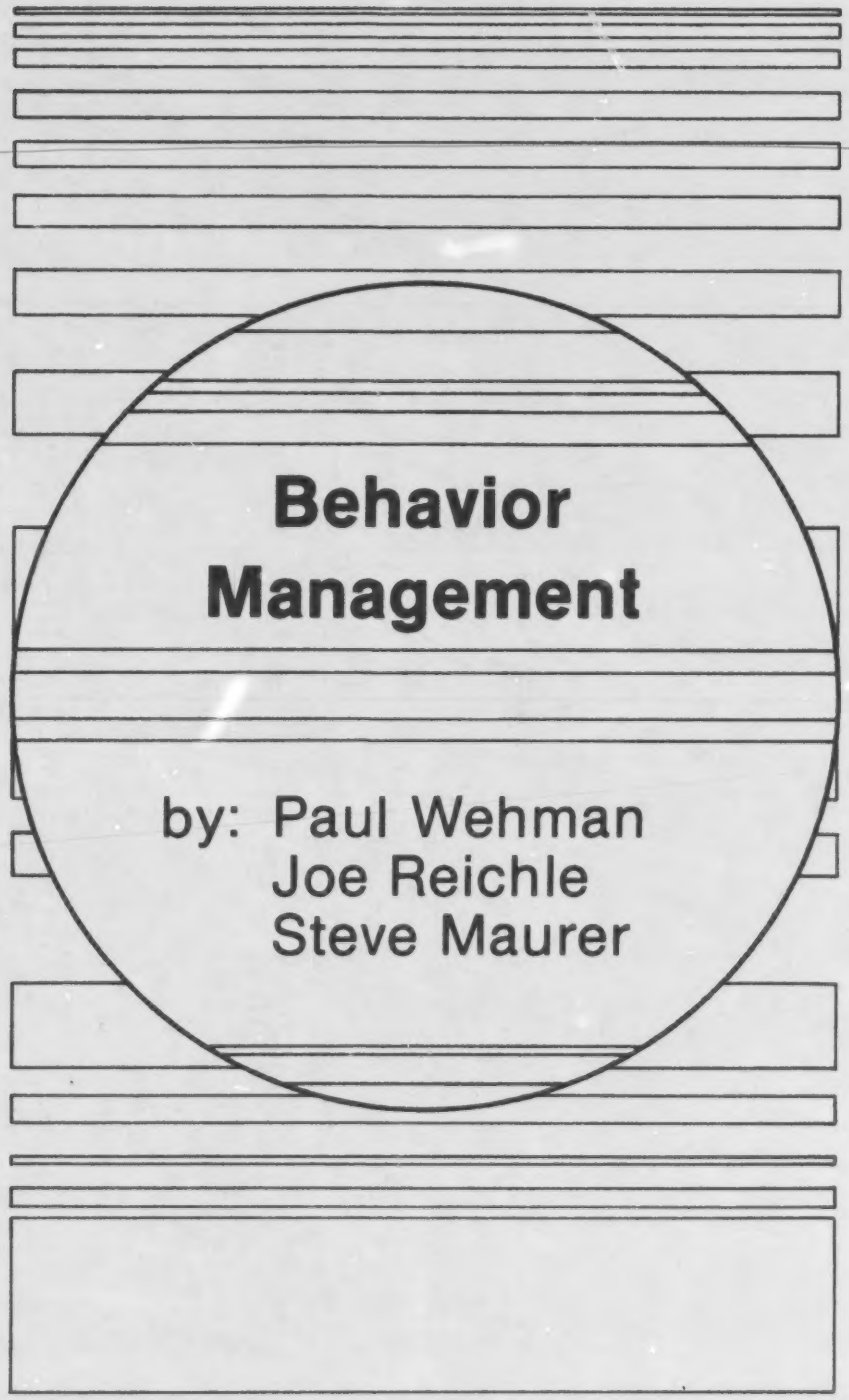
Williams, W., Brown, L., & Certo, N. Basic components of instructional programs for severely handicapped students. AAESPH Review, 1975, 1 (1), 1-39.

Wolfensberger, W. Vocational preparation and occupation. In A. Baumeister (Ed.) Mental Retardation. Chicago: Aldine Atherton, 1967.

Wyatt vs. Aderhold, 334 F. Supp. 1341 (N. D. Alabama, 1971), 325 F. Supp. 781 (N. D. Alabama, 1971).

Zimmerman, J., Overpeck, C., Eisenberg, H., & Garlick, B. Operant conditioning in a sheltered workshop. Rehabilitation Literature, 1969, 30, 326-334.

Zimmerman, J., Stuckey, T., Garlick, B., & Miller, M. Effects of token reinforcement on productivity in multiply handicapped clients in a sheltered workshop. Rehabilitation Literature, 1969, 30, 34-41.


Behavior
Management
by: Paul Wehman
Joe Reichle
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Overview

Behavior management is clearly not a science as of yet. It represents the art of applying learning technology to the maladaptive behavior of handicapped children in the classroom, home, vocational setting, or the community. Behavior management is rapidly becoming accepted by those in special education as a critical competency in the education and training of the severely and profoundly handicapped. Inappropriate social behavior decreases habilitation opportunities for handicapped individuals by: a) prohibiting integration into community living facilities, b) discouraging attempts at deinstitutionalization and c) reducing smooth transitions into the community labor force.

The goal of this module is to provide teachers and other practitioners with information concerning how to modify inappropriate behavior exhibited by severely and profoundly handicapped students. The module is divided into methods of increasing behavior, methods of decreasing behavior, and planning for transfer of training. This module will be taught most effectively over a period of four to six half-days.

The content of this module concentrates on information relevant to decelerating inappropriate behavior. This includes transparencies, worksheets, and handouts that describe time-out, over-correction, differential reinforcement as well as behavior analysis procedures. There is also information which pertains to developing new behavior, this primarily emphasizes principles of positive reinforcement.

Therefore, this module may be employed alone in teaching behavioral principles. Ideally, however, the instructor should rely more heavily on the material presented in the Systematic Instruction Module when concentrating on teaching new skills. Although there is some overlap in transparencies and articles used in each module, this module is more attuned to techniques for alleviating behavior problems.

A final word is in order about teaching methods to be used with this module. Role playing and behavior rehearsal are invaluable techniques to demonstrate the "right" way versus the "wrong" way. When participants evaluate the effectiveness of a peer in a practice situation, they will gain a greater understanding and familiarity with the technique. Viewing videotapes, as well has proven to be a helpful means of assessing better ways of positive behavior control.

Objectives

General Objectives

1. The participant will understand and implement the basic principles and procedures involved in increasing behavior.
2. The participant will understand and implement the basic principles and procedures involved in developing new behavior.
3. The participant will understand how to perform a functional analysis of behavior.
4. The participant will understand and implement major behavioral strategies available for decelerating undesirable behavior.
5. The participant will understand and implement the basic factors involved in programming transfer of training and maintaining behavior.

Specific Objectives

Accelerating Behavior:

1. Given the following terms, the participant will be able to define, recognize a definition of, give an example of, and recognize an example of each term:
   a. *antecedent*
   b. *consequence*
   c. *contingency*
   d. *positive reinforcement*
   e. *stimulus control*
   f. *discriminative stimulus*
   g. *negative reinforcement*
2. Given the following terms, the participant will be able to define, recognize a definition of, give an example of, and recognize an example of each term:
   a. *activity reinforcer*
   b. *primary reinforcer*
   c. *secondary reinforcer*
   d. *token reinforcer*
   e. *back-up reinforcer*
   f. *social reinforcer*
   g. *Premack Principle*
   h. *reinforcement menu*
   i. *reinforcer sampling*
   j. *differential reinforcement of other behavior*
   k. *removing interfering cues*
3. The participant will identify three methods of selecting reinforcers for children.
4. The participant will:
   a. identify the relationship between occurrence of a behavior and the time of presenting a reinforcer for maximum influence to be evident.
   b. describe the relationship between novelty of an event and its reinforcing effects.
   c. indicate the relationship between the kind and amount of reinforcement and rate of acquisition.
   d. describe the use of a reinforcer sampling procedure in relation to enhancing the reinforcing function of events.
   e. discriminate between consistent and inconsistent reinforcement.
   f. discuss the following deficiencies in reinforcing components (kind, amount, frequency) as it relates to inadequate contingencies, inadequate discrimination training, limited range of reinforcers, excessive dependency on immediate reinforcement, noncontingent reinforcement.
   g. list ways of identifying tentative lists of potential reinforcing events for individuals and for groups.

h. indicate the effects which continuous and intermittent reinforcement schedules have on the acquisition of a skill.

5. Given the following terms, the participant will be able to define, recognize a definition of, give an example of, and recognize an example of each term:
   a. *aversive stimulus*
   b. *avoidance behavior*
   c. *escape behavior*
   d. *negative reinforcement*

Developing New Behavior

6. Given the following terms, the participant will be able to define, recognize a definition of, give an example of, and recognize an example of each term:
   a. *prompting*
   b. *fading*
   c. *backward chaining*
   d. *forward chaining*
   e. *modeling*
   f. *physical or manual guidance*
   g. *instructions*
   h. *shaping or successive approximation*
   i. *correction procedures*
   j. *cue*
   k. *target behavior*
7. The participant will:
   a. develop a brief behavior chain.
   b. state a major advantage of backward chaining over forward chaining as it relates to the reinforcement of an entire behavior chain.
   c. explain how a series of previously learned responses can be combined and strengthened when reinforcement appears to occur only at the end of a behavior chain.
   d. explain the dual function of each behavior in a behavior chain.
   e. explain what occurs to a previously prompted behavior when a prompt is not faded.
   f. explain the basic instructional continuum of instructions, modeling and physical guidance.
   g. explain how modeling or imitation are an important means of teaching the severely handicapped.

Decreasing Undesirable Behavior

8. The participant will be able to define, recognize a definition of, give an example of, and recognize an example of:
   a. *differential reinforcement of other behavior*
   b. *extinction*
   c. *time-out from positive reinforcement*
   d. *response cost*
   e. *satiation*
   f. *overcorrection (restitution)*
   g. *positive practice*
   h. *verbal reprimands*
   i. *contingent restraint*
   j. *punishment*
9. The participant will be able to identify and implement the basic steps involved in a functional analysis of behavior.
10. The participant will be able to:
    a. state the difference between response cost and extinction.
    b. state an undesirable effect of an extinction program.

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c. state tne effect that the use of punishment has on the permanency of behavior.
d. list two advantages for the use of time-out and response cost.
e. list the guidelines for the effective use of time-out.
f. list the guidelines for utilizing an overcorrection procedure.
g. list the advantages of reinforcement of competing behaviors over other techniques to reduce behavior strength.

Transfer and Maintenance of Behavior

11. The participant will be able to define, recognize a defintion of, give an example of, and recognize an example of stimulus generalization (transfer of training) and response generalization.
12. The participant will be able to explain the necessity for planned efforts at maintaining program results.
13. The participant will be able to:
    a. distinguish between continuous reinforcement and intermittent reinforcement as to their effects on acquisition, maintenance and extinction.
    b. distinguish between small values of intermittent reinforcement and large values of continuous reinforcement as it relates to persistent behavior during extinction.
    c. list advantages of intermittent reinforcement over continuous reinforcement.
    d. identify the relationship between discrimination and generalization.
14. The participant will be able to define and explain the role of each of the factors listed below in programming transfer:
    a. practice in different environments
    b. involve parents and family
    c. teach self-reinforcement skills
    d. make program content meaningful
15. The participant will be able to define and explain the role of each of the factors listed below in programming maintenance of behavior:
    a. reducing the amount of reinforcement
    b. "thinning" the schedule of reinforcement
    c. having naturalistic reinforcers and fading contingencies
    d. teach self-reinforcement skills

Materials

Instructor

-"Principles of Negative Reinforcement" video tapes
-"Negative and Positive Reinforcement" video tapes
-monitor
-video tape deck
-blank transparencies
-overhead projector
-marking pens

Participant

-one copy per participant of pre-test
-one copy per participant of post-test
-copy of Glossary for each participant
-one copy per participant of "Identifying Behaviors and Consequences" and "Positive Reinforcement"
-one copy of "Discriminative Stimulus" per participant
-one copy of "Training Proficiency Scale" per participant
-one copy of "Antecedent Behavior Consequence Analysis" per participant
-one copy of "A Program in Behavior Change" per participant
-"Behavior Management Problems" case studies: one per small group
-one copy per participant of "Punishment Procedures"
-copies of "Problem Analysis Sheets" for each group of participants to analyze
-one copy of "Transfer of Training. . .An Evaluative Review" per participant
-one copy per participant of "Generalization" work sheet

Methodology

Note: Lecture notes for each presentation can be found in the article by Kauffman and Snell, "Managing the Behavior of Severely Handicapped Persons." This article can also be used as a handout.

Time	Methodology
	Pretest
20 minutes	Instructor presents lecture on identifying antecedents, behaviors and consequences (see Transparency A), emphasizing: 1. Antecedents are events or stimuli which precede behavior. 2. Target behavior is the response the teacher is observing and measuring. 3. Consequences are events or stimuli which follow behavior. 4. Antecedent events and consequences control the behavior which we exhibit.
	Behavioral terminology glossaries are handed out.
20 minutes	Instructor breaks class into dyads and passes out worksheets No. 1 and No. 2; each dyad completes them. Discussion follows.
20 minutes	Instructor presents lecture on basic principles of positive and negative reinforcement emphasizing: 1. Positive reinforcement refers to an increase in the frequency of behavior when followed by a pleasurable event or stimulus (see Transparency B). 2. With negative reinforcement, behavior increases contingent on the removal or termination of aversive or unpleasant event; may result in escape or avoidance behavior.
20 minutes	Instructor shows two video tapes: "Principles of Positive Reinforcement" and "Negative and Positive Reinforcement" (both from the University of Washington).
40 minutes	Instructor presents lecture on types of reinforcers and how to select an effective reinforcer.
60 minutes	Instructor presents lecture via transparencies "C" through "H" on how to maximize use of reinforcers.
20 minutes	Instructor presents lecture on discrimination learning and stimulus control emphasizing: 1. Discriminative Stimulus (S^D) is an event or stimulus which serves as a signal or cue for target behavior to occur. 2. Discriminative Stimulus is associated with behavior which is followed by positive reinforcement. 3. Through reinforcement of a response in the presence of one stimulus, and nonreinforcement of the same response in the presence of another stimulus, the process of discrimination is learned. (See discrimination learning article by Gold and Scott in Systematic Instruction Module for more notes.)

20 minutes	Worksheet No. 3 is given to dyads of participants and completed by them. Discussion follows.
50 minutes	Instructor describes the basic teaching sequence of instructions, modeling, physical guidance and correction procedures. Also the concepts of shaping, forward and backward chaining, prompting and fading (see Transparencies I and J). Worksheet No. 4 is handed out and discussed.
20 minutes	Instructor presents the six basic steps involved in a functional analysis of behavior via transparencies "K" through "M".
10 minutes	Worksheets No. 5 and No. 6 are handed out and completed by participants. Discussion follows.
40 minutes	Worksheet No. 7 is handed out to groups of three people. Each group, using the six steps in a functional analysis of a behavior, will complete the worksheet.
60 minutes	Instructor discusses time-out from positive reinforcement as a management strategy via transparencies "N" through "P". Instructor should role-play appropriate versus inappropriate use of providing time-out. Worksheet No. 8 is handed out and completed by participants with discussion following.
60 minutes	Instructor presents lecture on over-correction and positive practice procedures via transparencies "Q" through "T." Instructor should role play and demonstrate how these procedures can be used with several severe behavior problems such as stereotypic behavior.
60 minutes	Divide participants into three groups and hand out worksheets No. 9, 10 and 11 to them. Each group completes the worksheets and then presents their plan to the total group.
30 minutes	Instructor presents lecture on the importance of programming for generalization. "Transfer of Training . . .An Evaluative Review" is distributed. Worksheet No. 12 is handed out to dyads of participants and completed. Discussion follows.
25 minutes	Instructor presents five methods of promoting transfer of training and response maintenance.
20 minutes	Post-test

Suggested time for completion of module: approximately 12 hours.

Instructor Materials: Lecture Notes

Managing the Behavior of Severely Handicapped Persons

James M. Kauffman
Martha E. Snell

If there is a stereotype of the severely handicapped person, it is that of an individual who cannot do much of anything. While it is true that the severely handicapped person is by definition one who has extreme behavioral deficits, our work with these people has led us to the conclusion that they are capable of doing many worthwhile things --more useful and enjoyable things, in fact, than many casual observers would believe. However, the severely handicapped are often impeded by their behavioral excesses, and this makes it necessary to help them stop doing things that are maladaptive. In addition, there can be a problem in maintaining behavioral improvement, once progress has been achieved by the severely handicapped. There seems to be little point in working to achieve a goal if what has been taught cannot be retained over a reasonable period of time. Management of the behavior of the severely handicapped, then, presents three major problems:

1. How to train them to do what they can for themselves.
2. How to train them to stop inappropriate behavior.
3. How to ensure that they will continue behaving appropriately after they are taught the appropriate behavior.

The basic problems listed here are exactly the same as the problems one would list for ordinary people. The behavior of the severely handicapped is not so different from our own normal behavior; a whole new set of rules is not required. The principles of learning apply to us all, and the problems presented by the severely handicapped simply demand that we pay particularly careful attention to what and how to teach. There is less room for error in teaching the severely handicapped less chance for our errors to correct themselves or for chance learning to make up for sloppy teaching.

Implicit in all of the discussion that follows is the assumption that the teacher of severely handicapped persons will measure behavior. It is our view that failure to measure behavior will impede desired changes, especially when one is dealing with severe handicaps.

Applied Behavior Analysis

Behavior modification refers to a learning process whereby the strength or frequency of a behavior is changed by the purposeful arranging of environmental events which are antecedent or consequent to the behavior. A basic assumption is that behavior is a product of its consequences and may also come under the control of antecedent events which set the occasion for its occurrence. A teacher employing behavior modification must follow at least the basic essentials of analyzing the problem or targeted behavior in the applied setting. The steps involved in applied behavior analysis include: (a) selection of the target behaviors(s), (b) definition of that behavior in observable terms, (c) some form of direct observational measurement of the behavior, and graphic display of behavioral data, (d) antecedent-behavior-consequence (ABC) analysis and construction of the behavior change program, (e) consistent implementation of the behavior change program, and analysis of actual behavior change.

Selection of the Target Behavior

First the teacher must focus upon the behaviors which need to be changed (*increased* in frequency because the behavior is appropriate but occurs too infrequently, or *decreased* because the

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behavior is inappropriate and occurs too often). These questions need to be answered:

1. What do you want the child to stop doing? (Behaviors to decrease, e.g., hitting others, biting self, running out of classroom)
2. What do you want the child to do? (Behaviors to increase, e.g., play cooperatively with others, look at teacher or materials when asked, label colors)
3. How often do you want these behaviors to occur (targeted level)?

Later sections of this article explain more fully some examples of appropriate and inappropriate behaviors of the severely handicapped.

Defining the Behavior

The behavior definition should identify in observable terms exactly which characteristics of the child's behavior are of concern to the teacher. Exact definitions can assist a teacher by providing a convenient set of criteria which can be used to make quick judgments within the context of the classroom. Consistent application of behavior modification techniques is one of the key ingredients for successful behavior change, and clear definitions are the first step in the consistent implementation of a technique.

One way to check the clarity of a definition is to see whether two or more observers agree on the presence and the absence of the behavior: when the behavior begins, when it stops, and how long it has lasted. For example, if a teacher defined a child's attentive behavior merely as on-task, not only would the teacher observe responses that would be difficult to judge, but disagreement between observers probably would be frequent. Instead, the behavioral definition must state the specific observable event: "Within approximately five seconds of a teacher's verbal request to look at a particular person or material, the child's eyes are directed toward that person or material." In this example, frequency of visual attention is the primary concern of the teacher. However, at a later point in intervention, duration or length of visual attention also may be in need of improvement (e.g., the child may learn to look quickly in the requested direction, but then his attention may wander).

Observation Procedures and Graphing

A wide variety of observation procedures allow the teacher to estimate the frequency and duration of a behavior during given periods. Target behaviors should be measured over a period of days before any attempt is made to change the behavior (the *baseline* period). After a behavior change program is formulated and put into operation, the continuous measurement of the behavior before and during implementation serves as a barometer by which to judge the program's effectiveness. Do the target behaviors change in the desired direction? Do they reach an appropriate percentage of occurrence? The answers to these questions can be determined by examining the average measurement over a period of days in comparison to the baseline observation, as well as by observing the direction of the change when the behavior is plotted in graphic form.

Cooper (1974), Hall (1971), Hall, Hawkins, and Axelrod (1975), and White and Liberty (1976) detail the observation procedures which will be outlined briefly here. In general, two types of behavior measurement exist: observation involving the measurement of a behavior's lasting products or results, and measurement through the direct observation of an ongoing behavior.

Lasting Products. In the first case, a teacher counts and judges the quality of the tangible products of various academic, vocational, or social behaviors. Therefore, a teacher might measure the number of beads strung, the number of pictures sorted into correct categories, or the number of toys put away after a child's free time. Although counting the by-products of a behavior is often easier than counting occurrences of ongoing behavior, inaccuracies may result if the tangible products are destroyed, removed, or undone before the measurement is completed. Intervention programs which purport to improve academic and vocational behaviors are most easily and naturally evaluated by the measurement of their products.

Direct Observation. When behaviors are measured by direct observation, a teacher will observe during the periods *when* and in the settings *where* the behavior is of most concern. In general, the longer each observation period and the greater the number of observation periods, the more closely the measurement describes the actual behavior. However, since teachers have many demands on their time, it is essential to determine a realistic observation period when the teacher's attention may be directed toward a single behavior.

Measurement of behavior duration (how long the behavior occurs in a given period of time), is most easily done with a stopwatch. When the target behavior begins, the stopwatch is started and left to run until the behavior is terminated. During each additional instance of the behavior, the watch is started and then stopped when the behavior ceases; this results in a recording of the accumulation of time that the behavior was occurring during the total observation period. When such data is graphed, percentages most clearly display the proportion of time a given behavior occurred during an observation period.

Simple measurement of a behavior's frequency involves counting the number of times the behavior occurs during an observation period. A simple tally sheet or a wrist-worn golf counter facilitates accurate counting. If the total possible number of behaviors is fixed or predictable in advance by the teacher, percentages may be graphed (e.g., number of times teeth were brushed, classroom jobs were completed, the child imitated correctly on a ten-item sound-imitation test). However, if there are no constraints on the total number of behaviors that may be performed, then frequency (number of instances) is graphed. In Figure 1 the rate with which a severely retarded child ate soup is graphed as the number of spoonfuls eaten during each 20-minute observation session. Note that the behavior (percentage, number of times counted, amount of time observed, etc.) is displayed along the horizontal axis while the observation periods (days, weeks, etc.) are placed along the vertical axis of the graph. In this particular graph, the eating rate was decreased somewhat by reprimands. Then reprimands were withdrawn (baseline$_2$) and replaced by the teacher's imitation of the child's sloppy, rapid eating (imitate$_1$ and imitate$_2$). The consequence of teacher imitation tended to decrease the eating rate more effectively than simple reprimands.

If the teacher is unable to devote undivided attention; a time sampling procedure is the better method to use. The observation period is divided into a given number of equal segments, and the teacher observes briefly at the termination of each interval. If the child is engaging in the behavior at the time of the observation, a check is made on the recording form. Any other instances of the behavior are not recorded. In both methods, a clock with a second hand, a stopwatch, or an interval signalling timer is needed when intervals shorter than a minute are being used. With a longer interval, muffled kitchen timers or egg timers enable one to keep track of the passage of intervals.

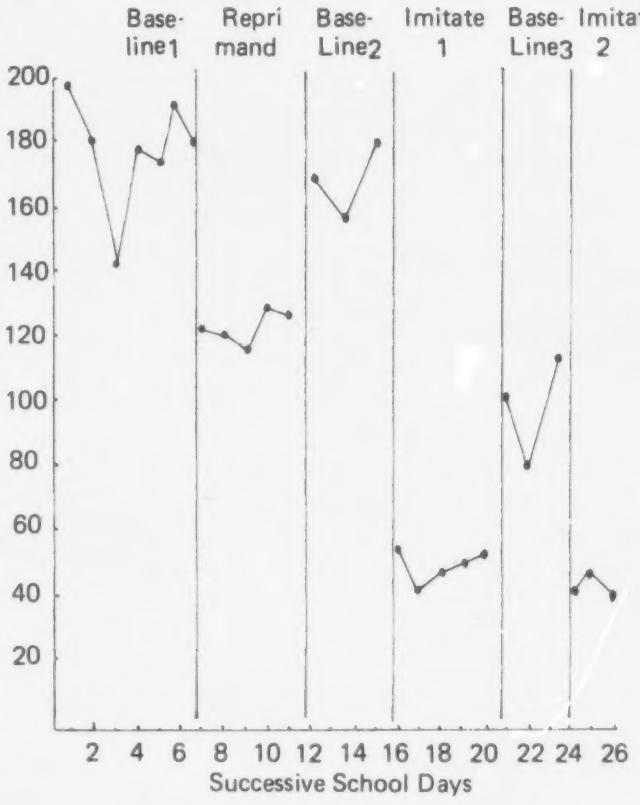

Figure 1. Spoonsful of soup eaten by a severely retarded girl during 20-min. sessions on successive school days.

Source: Kauffman, J. M., LaFleur, N. K., Hallahan, D. P., and Chanes, C. M. Imitation as a consequence for children's behavior: Two experimental case studies. *Behavior Therapy*, 1975, 6, 537.

ABC Analysis

Limiting and defining the problem behavior and measuring its baseline level at the time and in the situation where it is the most troublesome comprise the first steps in an ABC (antecedent-behavior-consequence) analysis. The remaining steps in this analysis enable a teacher to set behavioral goals and devise suitable behavior change strategies which will ensure the accomplishment of these goals (Worell & Nelson, 1974).

Preceding and during baseline observations, the teacher needs to determine the following:

1. What events occur immediately after the behavior (e.g., teacher gives attention, aide provides assistance, child is ignored)?
2. How often do these consequences occur and how consistent are they?
3. How aware is the child of the consequences (could the child verbalize these contingencies: does the child appear to anticipate the consequences)?
4. What apparent effect do the consequences have on the child's resulting behavior (e.g., undesirable behavior decreases initially, then reappears; behavior seems unaffected, etc.)?

Because behavior is viewed primarily as a product of its consequences, it is essential to delineate events which may maintain increase, or decrease the behavior. This information will be utilized when a behavior change strategy is formulated.

Determining Reinforcers and Punishers. During his stage of the analysis, the teacher must determine what the child likes and does not like. These positive and negative events or tangible items will be employed as consequences to reinforce desirable behavior and its successive approximations and, at times, to punish undesirable behavior.

1. What does the child like, i.e., what events act as reinforcers for the child? Reinforcers may be determined in a number of ways. If the child is verbal, he can be shown actual objects or pictures and asked to select those he likes. Also, the child's choice of activities, toys, or foods might be observed during the normal school day. A more structured observation of the child's preferences for foods or toys can be made by providing brief samples of three to six items, then allowing free access to the whole group of items and recording choice frequency. Finally, persons knowing the child (parents, peers, siblings, aides) might be asked what the child seems to like. Reinforcers should be arranged hierarchically from most to least liked.
2. What does the child dislike (punishers)? The removal of a positive reinforcer constitutes punishment. Punishers of the type which are presented to an individual (e.g., having to perform an unliked activity) may be determined by asking the child, observing what the child avoids or shows dislike for, or asking others who know the child. Punishers also should be arranged in order, from most effective to least effective.
3. Which reinforcers and punishers are appropriate for use in the classroom (may be applied easily, quickly, without harming the child, without administrative or ethical complications)? The effective reinforcers and punishers on the lists will be used to reinforce the desirable behaviors and, if necessary, to punish the undesirable behaviors.

All the information collected during the ABC analysis is relevant to the formulation of a behavior change program which is a specification of the things that will be done differently in the classroom to change the behavior from its present level to the desired level.

Implementing and Evaluating Behavior Change Programs

Once the specific behavior modification plan has been devised, it is put into action. To increase the probability of success, some essential steps must be taken and certain cautions must be heeded.

Essentials. Behavior modification consists of a process whereby a child learns to perform a new behavior in a situation where he formerly was allowed to abstain from that behavior or to perform another behavior. The child must learn new contingencies ("When I do this, the teacher does that."). This learning process takes time, especially when the child doing the learning is severely handicapped. Also, this process is most likely to occur if the teacher is consistent (every time a child initially engages in the desired behavior a reinforcing consequence is presented). When more than one teacher works

with the child, consistency across persons becomes important. Finally, learning is facilitated when the number of opportunities to perform are increased. The more a child performs a given behavior in a particular situation, and the behavior results in the same consequence, the sooner the child will come to understand the contingencies operating.

Sometimes, no matter how carefully an ABC analysis is performed or how consistently it is applied, a behavior change program will not result in the desired change. A teacher cannot determine objectively whether a behavior modification program is successful or unsuccessful unless the behavior is measured throughout the implementation period. Thus, ongoing measurement of the target behaviors by means of the same measurement procedure employed during the baseline period is another essential step for the teacher.

Cautions. Since the evaluation of a behavior change program rests upon accurate measurement, a teacher must try to eliminate sources of error. The best way to ensure confidence in a measurement procedure is to check inter-observer reliability; how close are two measurements of the same behavior observed by two people independently (Cooper, 1974; Worell & Nelson, 1974)?

A second caution concerns the observed fluctuations in a behavior during the initial days of intervention. Often a behavior change program will be "challenged" by a child. This especially occurs when attempts are made to decrease undesirable behaviors. The child's bad behavior may become worse before it gets better. The teacher must remember that a child who was very accustomed to particular consequences (e.g., tantrum resulting in getting what he wanted) is learning during the intervention period that the same behavior results in very different consequences (e.g., 3 minutes isolation in the time-out corner). The initial increase in an undesirable behavior is a natural testing of these new consequences.

When the initial change is an increase in undesirable behavior or when no immediate changes are observed, behavior intervention programs should nevertheless be continued for a reasonable period before being discarded, depending upon the target behavior being taught, how much teaching occurs per day, and how close the child's baseline behavior is to the target behavior. This trial period may range from a few days to a few weeks. Once the behavior graph indicates slope in the desired direction changes need not be made in the program unless: (a) goal has been achieved, (b) the behavior is changing too slowly, (c) undesirable behaviors seem to be increasing as a side effect of the program or (d) the intervention procedures are so tedious that they are interfering significantly with the rest of the classroom instruction. In the first case, another target may be selected while the first target behavior is placed on a maintenance program. In the second and third cases the elements of the program are re-examined (reliability, reinforcers, consistency, etc.) and changes are made. In the last case, the intervention program is simplified or the assistance of another individual is sought (aide, parent, regular classroom student, peer).

Planning and carrying out sensible modifications of behavior in the classroom setting requires diligent effort by the teacher. The rewards, however, are evidenced through the observable changes in the child.

Increasing Appropriate Behavior

Although severely handicapped individuals are frequently described by their obvious excesses of inappropriate behavior (e.g., aggressive behavior, nonfunctional repetitive movements), such excesses are almost invariably accompanied by deficiencies in appropriate or adaptive behavior. These deficiencies may include: little or no language; lack of independence in toileting, dressing, and basic grooming skills; inability to match identical objects; lack of competence in such skills as rote counting, color naming, playing with others, ball throwing and catching, and crossing streets.

These deficiencies may often precede and contribute to the development of inappropriate behavior. The converse is also true: when a severely handicapped individual possesses a balance of appropriate behaviors, it is less likely that inappropriate behaviors will be learned. When a person can express wants, is listened to, and has the basic social skills which make one likeable (smiles, social greetings for others, eye contact), that individual is less apt to withdraw from others or to resort to aggressive behavior to satisfy his needs. Although space does not permit description of the wide range of behaviors appropriate for severely handicapped individuals, several major groupings will be discussed.

Characteristics of Appropriate Behavior

At any point in a severely handicapped individual's development, teaching targets may need to be selected in all the following areas: self care. social interaction, pre-academics (early thinking and reasoning skills), language, and fine and gross motor skills. Although the choice and sequencing of such targets is not a totally arbitrary decision, the development of appropriate behaviors will probably always span these diverse areas for a severely handicapped student. As the severely handicapped child grows older and has mastered the basic components of these skill areas, two additional areas of teaching become relevant: daily living and prevocational skills.

All these areas overlap somewhat and cannot be neatly separated from each other. For instance, the receptive language skills (understanding another's gestures or spoken words) are a facet of all the skill areas. Likewise, buttoning, using a fork. and toothbrushing rely upon an individual's fine motor skills of finger and wrist manipulation.

Each skill area may be mapped out in a developmental sequence. For example, when an individual first learns to eat with a spoon. it is held in a palm-down or fist-grasp position and later in a palm-up or finger-grasp position. Also, spoon usage is mastered after one can eat finger foods but before learning to use a fork and before mastering most dressing skills. Each specific behavior in these developmental sequences may be subdivided into *small teaching steps* which are ordered from the easiest or first taught to the hardest or the target behavior. Some steps in teaching spoon usage may include: holds spoon in palm-down position (no eating); holds and uses spoon when given total manual guidance; puts filled spoon into open mouth unaided, when given manual guidance for dipping food; dipping, lifting, and directing spoon. These ordered teaching steps may be used as informal checklists to determine how much of a skill an individual possesses before teaching, where to begin teaching that individual, and how much an individual has learned after teaching.

After assessing an individual's present or baseline level of behavior against such a checklist, the teacher will observe one of the following in the individual:

1. He is not able to perform even the simplest behavior.
2. He is able to perform only the simpler behaviors on the list.
3. He is able to perform many or even all of the behaviors *but* (a) does not perform these behaviors frequently enough or without help (e.g., will label body parts about half the time), or (b) performs the behaviors in one place but not in others (e.g., brushes teeth at school but not at home).
4. He is able to perform the target behavior whenever appropriate without assistance, and in a number of different places.

Several different teaching techniques will be described next which may be differentially applied to improve the first three types of outcomes. When a teacher discovers the fourth outcome (complete mastery of a skill), it is important to maintain these behavioral gains and also to select more advanced instructional targets from the same skill area.

Positive and Negative Reinforcement

When an individual's behavior is immediately followed by events that are enjoyed by or reinforcing to that individual, the behavior is more apt to recur. This arrangement is called *positive reinforcement.* To state this another way, positive reinforcement consists of an arrangement in which a behavior is consequated by the presentation of a positive reinforcer or rewarding event. When reinforcers are repeatedly made dependent or contingent upon an individual's performance of a certain behavior, the increase in that behavior will be quite noticeable. We believe that positive reinforcement is the most powerful instructional tool a teacher may apply; it can be used to teach an individual to do something he cannot already do, can do only partially, or can do but refuses to perform. The success of positive reinforcement depends upon at least two teacher characteristics: the ability to determine those events which, when presented, are reinforcing to a child; and the ability to provide those reinforcing events without fail after the behavior has occurred (to reinforce the child contingent upon the desired behavior). (The scheduling of reinforcement is discussed in the following section of this article.)

Another arrangement of events, often confused with punishment, is called *negative reinforcement*. Although it is not often useful as a teaching tool, negative reinforcement can operate without our awareness and, predictably, results in the increase of certain behaviors that are frequently undesirable. Negative reinforcement occurs in the midst of an unpleasant situation. The behavior that is reinforced acts to reduce or remove the unpleasant, painful or discomforting aspects of the situation. To state this another way, negative reinforcement consists of an arrangement in which a behavior is consequated by a reduction or removal of negative reinforcers (aversive or punishing events). For example, an individual quickly learns to leave a painfully noisy room or to cover his ears; a child learns to complete an assignment to avoid the teacher's disapproval; and a mother may unintentionally learn to grant her child his requests to avoid his anger, crying, or tantruming.

Negative and positive reinforcement are similar in two ways: both lead to an increase in the reinforced behavior, and both may be applied accidentally (without our realization), as well as intentionally, to modify behavior.

Schedules and Immediacy of Reinforcement

When the behavior of an individual being positively reinforced begins to increase, the individual has learned the contingency that is in operation ("If I perform this behavior, then that event will occur."). If the reinforcer is given immediately after the behavior occurs, and before another behavior intervenes, learning will occur more quickly because the cause-and-effect relationship is emphasized and no intervening behaviors are accidentally reinforced. Also, if every instance of the targeted behavior is reinforced (a continuous reinforcement schedule), the individual will have more opportunities to learn the contingency and have no exposure to exceptions (no nonreinforced instances of behavior). Therefore, when positive reinforcement is first being applied to a behavior, it is essential that reinforcement be immediate and continuous.

After the teacher observes an increase in the behavior, the continuous reinforcement schedule should be changed gradually to a partial or intermittent schedule. This means that reinforcers should be presented intermittently or after only *some* instances of the behavior (after every second, every fourth, on the average of every fourth behavior, etc.) but no longer after every instance. The reasons for using an intermittent schedule become clearer when one considers the individual's view of the situation. With continuous reinforcement, the individual learns the behavior quickly but, because every behavior is reinforced, he does not learn to be persistent in situations where no reward is forthcoming. We may say that this behavior is not very "resistent to extinction" or that it is not very strong in the absence of reinforcement. Since no one can realistically expect continuous rewards we believe it is the teacher's responsibility to gradually replace continuous schedules of reinforcement with intermittent schedules. Furthermore, intermittent schedules reduce the time and effort required of the teacher by allowing the teacher to attend directly to only a portion of the child's appropriate performance.

It is possible for a teacher to schedule reinforcement either according to the number of behaviors (*ratio schedules:* every nth behavior is reinforced) or by the amount of time passing in relation to the behavior (*interval schedules:* the first behavior occurring after the passage of *n* minutes or days is reinforced). When behaviors are discrete (separate and easily counted), ratio schedules may be applied (e.g., labelling objects when asked during language training time, putting on one's jacket). With fleeting or less visible behaviors, or when reinforcing one or more individuals while simultaneously managing a large group, a teacher is advised to use interval schedules. Large wall clocks with second hands, egg timers, and muffled kitchen timers serve to alert the busy teacher of the passage of time. When using interval schedules, it is important to remember that reinforcement is not simply given at the interval's end, but following the first behavior that occurs after the interval is completed.

With both ratio and interval schedules, a teacher does *not* need to be mindful of *exact* behavior counting or interval timing (Hall, Hawkins, & Axelrod, 1975). If an individual has mastered a behavior fairly well, and the teacher decides to replace continuous reinforcement with a ratio schedule of one reinforcer for every three behaviors, the teacher may merely approximate this schedule by reinforcing on the average of every third behavior. Averaged (variable) schedules produce greater persistence than constant (fixed) schedules for the same reason that intermittent schedules result in more persistent behaviors than do continuous schedules---it is harder for the student to figure out whether the absence of reinforcement following a response is just part of the schedule or whether there will in fact be no more reinforcement.

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Shaping and Chaining

It is seldom that new behavior is performed perfectly the first time it is taught and this is especially true with severely retarded individuals. It is more likely that, during the early stages of teaching, a small fraction of the behavior is perfectly performed, and over time more and more of the behavior is performed with increasing perfection. When a teacher provides reinforcement for successively better approximations of the target behavior, until eventually reinforcement is contingent upon exact performance of the target behavior, the teaching process is called *shaping*.

In the section of this article which described characteristics of appropriate behavior, mention was made of analyzing the targeted behavior into smaller, ordered teaching steps. It was suggested that these steps be used as checklists to determine where to begin teaching a skill. If these steps are ordered from simple to complex, they may also be regarded as levels of successive approximation and used to guide the shaping process. However, the first instance of the target behavior may be brief, largely inadequate, and therefore difficult to recognize. In fact, the first instance may be of markedly lower quality than the first teaching step. When this is the case, a teacher should *not* wait for a better approximation but immediately reinforce that beginning level of the behavior, thereby strengthening its frequency and increasing the probability that better approximations will be performed. Since it is not always obvious when a given behavior is better or worse than the behavior which was reinforced earlier, a teacher must attend carefully to approximations while not losing track of the targeted behavior. The art involved in shaping behavior is especially obvious when one attempts to shape random vocalizations into comprehensible speech.

Many behaviors actually consist of a chain of smaller component behaviors performed in a certain sequence. Toothbrushing, for example, was divided into 12 behaviors by Horner and Keilitz (1975), ranging from picking up and holding the toothbrush to putting the equipment away and discarding the disposables. Most self-care skills and other fine and gross motor movements, as well as speech and gestures, may be regarded as behavior chains. When a skill involves a performance chain, the teacher may use a specific teaching procedure called forward or backward *chaining*. Both methods involve the linking of one learned behavior in the chain to the next behavior. In forward chaining, the individual is taught to perform the first step at the beginning of the chain (e.g., pick up toothbrush, pick up spoon) and, as learning occurs, teaching proceeds forward:

1. The individual attempts the first step and receives reinforcement.
2. The individual performs the first step perfectly and receives reinforcement.
3. The individual performs the first step perfectly, attempts the second step, and receives reinforcement.
4. The individual performs first and second steps perfectly and receives reinforcement; and so on.

Depending upon the type and length of the task, the teacher may guide the individual through the remainder of the chain after providing reinforcement at each teaching level.

In backward chaining, teaching begins with the last step and proceeds backwards towards the beginning of the chain as each step is mastered. However, the teacher generally helps the learner through all the preceding steps until the instructional step is reached. At this point, guidance is withheld and the first approximation of that step performed by the learner is followed by either: (a) reinforcement, when the instructional step is the last step in the chain, or, during later stages of teaching, (b) independent performance by the learner of all the remaining steps in the chain, after which reinforcement is immediately given.

Backward chaining has the advantage of associating teacher-applied reinforcement with the natural reinforcement of task completion. Therefore, when teaching eating and dressing, backward chaining generally is preferred over forward chaining. When a teacher is uncertain in which direction to shape, it is helpful to examine the learner's current performance and teach at the end of the chain where the larger number of steps are approximated.

Secondary and Token Reinforcement

Unlike food and other primary, unlearned reinforcers, the most common reinforcers (praise, smiles, pats on the back, money) rely upon an awareness by the reinforced individual of the reinforcer's value. These are called *secondary reinforcers* and depend upon certain prior learnings and

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earlier associations with other reinforcers. For instance, if a certain behavior is to be modified by contingently applied teacher praise. the individual must understand the words and their relation to the behavior and must be comfortable in the teacher's presence. With the severely handicapped student the teacher cannot assume that all commonly mentioned secondary reinforcers actually have reinforcing value for a particular child. Instead, the value that secondary reinforcers have for certain individuals needs to be determined by the observation of their effect on a behavior and, when lacking, this value needs to be taught.

How does one teach another individual to value an event such as praise, smiles or money? The best method involves learning by association——the pairing of known reinforcers with events which are not reinforcing. For example, prior to giving a snack the teacher might smile and praise the child for sitting. Over time, praise and smiling would take on reinforcing qualities by their association with food. It is best to present the potential secondary reinforcer immediately preceding the primary reinforcer. As the individual begins to show some appreciation for the secondary reinforcer (smiles back, reaches for a handshake, etc.), the teacher may put the primary reinforcer on a more intermittent schedule while continually providing the secondary reinforcer.

It is important to assess the cognitive prerequisites upon which certain reinforcers depend and to match secondary reinforcers to the individual's level of comprehension. Reinforcing with praise demands an awareness of the vocabulary and the complexity of language used. When using money as a reinforcer, one must be sensitive to the mathematical skills involved in preferring a dime over a nickle or five pennies over three.

Another class of secondary reinforcers includes token reinforcement. Tokens may be any concrete item (poker chip, washer, penny, checkmark, star) that is provided as a result of certain behaviors and exchangeable for primary or back-up reinforcers (trinkets food, beverages). By their association with other reinforcers, tokens acquire a reinforcing value. Tokens have advantages over primary reinforcers in that they can be given more easily and are less apt to diminish in their reinforcing power, since each is exchangeable for one of many back-up reinforcers. Also, tokens serve as a transition stage between edible and other tangible reinforcers and the more abstract reinforcers such as praise, smiles, self-satisfaction.

Money is a token system with which we all are quite familiar and to which most of us are quite responsive. The coins in our money (token) system have specific values which must be known in order to use the system. Specific-value token systems have been successfully used to treat moderately and severely retarded and disturbed individuals (Kazdin & Bootzin, 1972), to increase various academic skills (Baker, Stanish, & Fraser, 1972; Dalton, Rubino, & Hislop, 1973), to teach language skills (Baer & Guess, 1973), and to decrease inappropriate behavior (Hislop, Moore, & Stanish, 1973).

Many severely handicapped individuals will not be able to count or associate specific exchange values with tokens, although this may be learned later. For these students, a varying-value token system is more immediately appropriate. In this type of system, tokens are not assigned an exchange value but are merely awarded contingent upon certain behaviors and are exchanged in varying amounts whenever the teacher decides that the back-up reinforcers are necessary.

Initially, when an individual is trained to associate tokens with reinforcers, the teacher selects a behavior that is easily performed by the student (e.g., imitating movements, pointing to objects upon request). The teacher directs the individual to perform, and each occurrence of this behavior is reinforced with a token. The token is immediately exchanged for the student's choice of a single back-up reinforcer. This process continues until the student shows signs of associating tokens with the reinforcer, signs such as reaching for the tokens or anticipating an exchange by handing the tokens back to the teacher. At this point, the teacher gradually shifts the exchange schedule from continuous to intermittent. When the student is able to collect four or five tokens a token container is introduced. Teaching the student to lift and empty the container facilitates the collection and exchange procedure. An individual's exchange schedule may be gradually shifted in proportion to his performance; some individuals will easily learn to exchange after every 15 to 20 minutes of continuous performance with tokens and praise, while others may need to exchange every few minutes after perhaps only ten performances. We have found that many minimally skilled, nonverbal individuals have responded to token reinforcement after token training sessions lasting from 10 to 15 minutes.

Antecedents: Stimulus Control

Until now, the techniques described to increase appropriate behavior have been concerned with consequences, what the teacher may do after a desirable behavior occurs. In addition to consequences, there are a number of teaching procedures which are applied before the occurrence of the appropriate behavior and which serve to encourage its performance by creating opportunities for reinforcement. These antecedent events include: instructions to the learner, modeling, response priming (prompting), and the complimentary process of fading. Each technique facilitates a discrimination learning process called stimulus control (learning to perform a certain behavior in the presence of specific visual, auditory, kinesthetic, and/or tactual stimuli). For example, when a child learns to wash his hands, get his lunchbox, and sit at a given place for the noon meal, we could say he has discriminated certain critical antecedent stimuli or cues in the presence of which handwashing, getting lunch, and sitting at a certain place are reinforced by praise and the opportunity to eat. These antecedent stimuli probably include stomach contractions, the teacher's request to prepare for lunch, and the sight of others getting ready. The bulk of all learning actually involves various stimulus discriminations. Instruction modeling, and prompting will be discussed next as methods to expedite discrimination and stimulus control of certain behaviors.

Instructions. Verbal directions, adjusted to the learner's level of comprehension, are valuable in helping some learners to perform desired behaviors. After the individual's attention is gained, directions should be simply stated and may provide various cues concerning the behavior the individual should be, but is not readily, performing (e.g., "Look at me.") For individuals with fewer comprehension skills, instructions may be accompanied by gestures (e.g., the teacher says, "Sit here." and points to a chair). When instructions alone are not sufficient to encourage the behavior, they may be paired with modeling or with prompting.

Modeling. Modeling or demonstrating the desired behavior for the learner is a common teaching method used by teachers at all grade levels. Modeling is useful because it provides more specific assistance to the learner than do instructions alone. When modeling is employed with the severely handicapped, the teacher should make certain adjustments. After getting the learner's attention, the behavior or a small portion of the behavior is slowly performed from a position *alongside* the learner. Often, the individual may be requested to imitate ("Do this,") before the model is presented. As when using a shaping procedure, the teacher need not expect a perfect imitation initially but should reinforce successively better copies of the model. In general, the model should not be repeated more than once if the individual does not begin to imitate. Instead of providing additional repetitions, the teacher should prompt the learner to imitate the model.

Response Priming, Prompting, and Fading. Often a learner will not respond to directions, models, appealing teaching materials, or even the presence of reinforcers. In these situations where no behavior occurs, shaping cannot be used. Skinner (1968) called this frustrating point in teaching "the problem of the first instance" (p. 206). At these times the learner's response may be primed or prompted with cues (e.g., pointing to or tapping near the correct choice) or with manual guidance (e.g., moving the learner through part or all of the desired behavior). Prompts may be partial or complete in the amount of assistance they provide to the learner. Initially, a teacher may need to prompt a nonperforming learner with a *complete* prompt such that the teacher physically assists the learner in performing the entire response and gives reinforcement for passive cooperation. However, in order for complete learning (stimulus discrimination) to take place, this assistance needs to be faded or gradually eliminated, thereby requiring the learner to perform more on his own. Therefore, during fading partial prompts are used by the teacher and eventually eliminated completely. It is also true that models and instructions serve to prompt a behavior. Models and instructions must also be faded so that the individual learns to attend to the relevant stimuli and does not become dependent upon the teacher's assistance.

Horner and Keilitz (1975) used all three levels of assistance (instruction, modeling, and prompting) to teach severely handicapped individuals to brush their teeth. These authors faded assistance by decreasing the amount and level of assistance--from all three, to modeling with

instructions, to instructions alone, and finally to no instructions. In addition, these teaching techniques have had wide application with the severely handicapped in teaching other self-care skills (Nelson, Cone, & Hanson, 1975; O'Brien & Azrin, 1972; O'Brien, Bugle, & Azrin, 1972), imitation skills (Baer, Peterson, & Sherman, 1965; Striefel & Phelan, 1972) motor skills (O'Brien, Azrin, & Bugle, 1972; Peterson & McIntosh, 1972), language skills (Ausman & Gaddy, 1974; Baer & Guess 1973; Garcia, 1974; Guess & Baer, 1973), functional academic tasks (Bellamy & Buttars 1975; Dorry & Zeaman, 1975), and vocational skills (Crosson, 1969; Gold, 1972; Karen, Eisner, & Endres, 1975).

Decreasing Inappropriate Behavior

There are severely handicapped individuals who exhibit little behavior that needs to be stopped, but they are the exception rather than the rule. Historical and contemporary accounts make it clear that many of the severely handicapped are characterized by multiple problems, including disorderly, inappropriate, irritating, and destructive behavior (cf. Balthazaar & Steven, 1975; Kauffman, in press-a, in press-b). The unfortunate teacher who expects students to be tractible merely because they are not labeled "emotionally disturbed," "psychotic," or something else associated with socio-behavioral deviance is in for an abrupt awakening. Although all of the undesirable acts that severely handicapped individuals might perform cannot be listed here, we will describe several major classes of behavior that frequently create problems.

Undesirable Behavioral Characteristics

Many of the undesirable behaviors of the severely handicapped involve basic biological processes, such as eating and elimination. Soiling (encopresis) and wetting (enuresis) are frequently problems. Eating may present problems not only because the individual is sloppy or throws food, but also because the severely handicapped often grab or steal food from others (especially in institutional settings) or eat trash or other inappropriate substances. Aggressive behavior, such as hitting, biting, scratching, poking, is commonly encountered and may be directed toward others or performed on oneself. It is very disconcerting to see one individual maul another or to be the target of aggressive attacks, but it is also disquieting to see a person viciously attack his own body. Bachman (1972) and Frankel and Simmons (1976) have reviewed data indicating that 5 or 6% of severely handicapped institutional residents exhibit self-injurious behavior in which they endanger their own health or life. Another problem is self-stimulation-- excessive activity that is socially inappropriate, seems to serve only to provide sensory feedback, and interferes with other adaptive behavior. Finally the severely handicapped are prone to a variety of other objectionable responses that are common among normal and mildly disturbed individuals (tantrums, arguments, lewd talk or gestures, negativism, and so on). We will describe several strategies for reducing or eliminating such unwanted activity.

Instructions

We believe that one should always try to find the simplest effective solution for the problem of disordered behavior, and there is nothing simpler than telling a person how you want him to behave. Setting up an elaborate system of rewards and punishments is pointless if simple instructions will suffice. Of course, instructions to stop a misbehavior are in many cases ineffective, but giving instructions requires so little effort and is so natural that one is foolish not to make it the first technique to try. Two points are particularly important to remember when giving instructions. First to have the best chance of success, instructions must be given when the child is paying attention and must be direct, simple, clear, and consistent. Many times instructions fail because they are given while the child is not paying attention, they are too complicated, they are not given with sufficient clarity and directness, or they are not consistent over time and congruent with nonverbal behavior. In the case of misbehavior, good instructions will mean that the severely handicapped student is oriented toward the teacher and has eye contact, and that the teacher will give a simple, loud, clear, and direct command ("No!" or "Stop!"), rather than, "Randy, please don't hit Susan: it hurts when you hit." The teacher's facial expression and other nonverbal communication must be consistent with the verbal instruction (indicative of displeasure), and the instruction must be given consistently for the

inappropriate response. Second, instructions ultimately derive their effectiveness from the consequences of behavior. The consequences of following instructions to stop a misbehavior should be pleasant (in this case, *negatively* reinforcing because the student escapes or avoids unpleasantness), and the consequences of disregarding such instructions should be unpleasant. In short, the instructions to stop a misbehavior should themselves be unpleasant for the student; compliance with the instructions should be reinforced and noncompliance should be punished. If the consequences are consistent, instructions to stop inappropriate behavior will become an effective warning.

Reinforcement of Appropriate Behavior

One strategy for decreasing undesirable behavior is to provide positive reinforcement for responses that are *incompatible* with (cannot happen at the same time as) the undesirable response. For example, a child's eye-poking might be reduced by providing reinforcement when his hands are away from his face.

Reinforcing incompatible responses may be a good strategy to use, but a more important consideration is simply that *reinforcement must be provided for appropriate behavior or the behavior management program will fail.* That is, regardless, of what other techniques are employed in attempts to reduce problem behaviors, the success of a behavior management program hinges on making the performance of appropriate behavior rewarding for the severely handicapped person. It has frequently been our experience that, once the individual is provided with something appropriate to do and is reinforced for doing it, the inappropriate behavior vanishes. The reinforcement of appropriate behavior is particularly applicable in institutions providing custodial care, but it applies also to the classroom where pupils are not kept engaged in appropriate tasks (cf. Repp & Deitz, 1974; Vukelich & Hake, 1971).

Extinction

One of the principles of behavior is that, if a response is not reinforced, it will occur less and less frequently and will eventually disappear. The procedure of cutting off the reinforcement that serves to maintain an inappropriate behavior (extinction) has been found to be a most useful tool, as long as positive reinforcement is provided for appropriate responses as well. Extinction can be used effectively only if one can identify the reinforcers maintaining the undesirable behavior and keep them from being obtained in the wrong way. Two factors are important: first, unless *all* reinforcement for the undesirable behavior can be withheld, the extinction procedure will be counterproductive; second, extinction is a relatively slow procedure, and it is likely that there will be an initial increase in the inappropriate behavior before it begins to wane, even if all reinforcement is stopped.

Extinction, especially when combined with other techniques, has proven to be very useful in working with the severely handicapped. The classic case reports of Wolf, Birnbrauer, Williams, & Lawler (1965) and Zimmerman & Zimmerman (1962) illustrate the therapeutic use of extinction procedures with the severely handicapped. Zimmerman and Zimmerman found that temper tantrums and refusal to do academic tasks could be controlled by removing adult attention, the apparent reinforcer, for these trying behaviors. Wolf and his colleagues found that frequent vomiting ceased to be a problem when adult attention and opportunity to leave the classroom were withheld.

Punishment

Many people have a negative reaction to the idea of punishing children, especially severely handicapped children. Yet, in some cases, punishment is the most effective and humane way of decreasing inappropriate behavior (MacMillan, Forness, & Trumbull, 1973). Punishment refers to presenting aversive stimuli or withdrawing positive reinforcers contingent on a response. That is punishment may be of two basic types: *aversive conditioning* in which one presents aversive stimuli (electric shock, slaps), or *response cost,* in which one takes away positive reinforcers (points, tokens, food). Punishment need not involve pain or humiliation, but by definition punishment does decrease the rate of the punished response.

In order to be used humanely and effectively, punishment must not be the focus of behavior management. Furthermore, it should always be easy for the individual to escape or avoid punishment altogether--there should always be an obvious way to behave appropriately and obtain rewards and rewards for appropriate behavior should be the focus. When punishment is required there are several alternative methods to consider.

Aversive Conditioning. Aversive conditioning is most clearly justified in cases of self-injurious or other dangerous behavior. Contingent electric shock has been used, for example, to eliminate self-injurious behavior in severely disturbed and severely retarded children (cf. Frankel & Simmons, 1976). Milder forms of aversive stimuli have been used successfully to resolve other types of behavior problems. Hall, Axelrod, Foundopulos, Shellman, Campbell, and Cranston (1971), for example, found that a child's biting and pinching could be diminished by the teacher's pointing at the child and shouting, "No!". Koegel, Firestone, Kramme, and Dunlap (1974) were able to lower the level of autistic children's self-stimulation by sharply saying, "No!", and briskly slapping or briefly holding (immobilizing) the part of the child's body involved. Salzberg and Napolitan (1974) found that holding a child's hands on a table for two minutes, contingent on his playing with doors and staring out of windows, quickly reduced his inappropriate object contact. Kauffman, LaFleur, Hallahan, and Chanes (1975) reported a case in which the teacher's imitation of a severely retarded child's inappropriate eating was highly aversive. It is important to recognize that, when aversive conditioning is used appropriately, the aversive stimuli are applied only for a specific undesirable response, that all punishment or threat is removed as soon as the undesirable behavior stops, and that ample positive reinforcement is provided for desirable behavior. The key is to make sure that negative consequences consistently follow undesirable behavior and *only* undesirable behavior.

Response Cost. Response-cost punishment can be used only if the individual being punished has previously been given rewards. One cannot take away what someone does not have. The important thing to remember about response-cost punishment is that a reasonable amount of a positive reinforcer must be taken from the individual contingent on a response. That is, an inappropriate response must cost the misbehaving person something; he must experience a fine. The fine may consist of taking away tokens, food, play time (Sulzbacher & Houser, 1968), or even colored slips of paper with the child's name written on them (Hall et al., 1971). There is no point in fining someone who has no valued commodity to take away, who does not understand the relationship between his behavior and loss of rewards, or who does not value what is being taken from him. However, in a predominantly positive behavior management program where the person is earning positive reinforcers response cost is often a highly effective punishment technique.

Time Out. One of the most useful techniques for decreasing undesirable behavior is time out from positive reinforcement (an aversive or punishing event). Time out implies that there is an on-going program of positive reinforcement from which one can take a break. In the absence of positive reinforcement, one cannot have an effective time out. A time-out procedure means that, contingent on a specific undesirable response (hitting, throwing a temper tantrum), the person will not be able to obtain positive reinforcement. Typically, time out means social isolation; for a brief period of time the person has no opportunity for social interaction and no opportunity to experience rewarding consequences. Time out may mean isolation in a separate area, or it may mean simply that the teacher turns away and refuses to interact with the miscreant.

Like all other consequences used to modify behavior, time out must be applied immediately and consistently in order to be effective. The effectiveness of time out is likely to be greater, too, if a minimum of anger or upset is shown by the teacher when the child is placed in time out. Distress signals on the part of the teacher are likely to be social reinforcers for misbehavior, so maintaining a firm but matter-of-fact demeanor is important. Short time-out periods (5-10 minutes) are usually as effective as long ones (30-60 minutes) if they are applied consistently (White, Nielsen, & Johnson, 1972), and short time-out periods have the advantage of letting the individual spend more time in situations where appropriate behavior can be rewarded. However, it is inadvisable to release the child from time out while tantrums or other inappropriate behaviors are being exhibited, even if the time-out interval has passed.

Time out has been used successfully to modify a wide variety of troublesome behaviors of severely handicapped persons (Sachs, 1973). Aggressive and disruptive behavior (Bostow & Bailey, 1969), inappropriate mealtime behavior (Barton, Guess, Garcia, & Baer, 1970), self-injurious behavior (Lucero, Frieman, Spoering, & Fehrenbacher, 1976), and other inappropriate acts have been reduced or eliminated by using time out in one form or another.

Overcorrection. There are two basic forms of overcorrection: *restitution,* or restoring the environment to a condition better than its condition before the misbehavior occurred, and *positive practice,* or practicing a more correct form of behavior contingent on a maladaptive response. Overcorrecting the deviant behavior of severely handicapped persons, techniques pioneered by Nathan Azrin, Richard Foxx, and their co-workers, has been found highly effective with a wide array of problems, including garbage-eating (Foxx & Martin, 1975), theft (Azrin & Wesolowski, 1974), aggression (Foxx & Azrin, 1972; Webster & Azrin, 1973), self-stimulation (Azrin, Kaplan, & Foxx, 1973; Epstein, Doke, Sajwaj, Sorrell, & Rimmer, 1974; Foxx & Azrin, 1973), and self-injurious behavior (Azrin, Gottlieb, Hughart, Wesolowski, & Rahn, 1975).

Overcorrection techniques have been designed with the characteristics of particular behaviors and individuals in mind, but the principles of making restitution or practicing appropriate behavior have guided intervention. For example, in overcorrecting theft, Azrin and Wesolowski (1974) required retarded persons who stole food from others not only to return the stolen item but to make restitution by purchasing an identical new item and giving that to their victims too. In overcorrecting self-stimulation, Foxx and Azrin (1973) required children to practice a more correct or appropriate form of behavior for a specified period of time contingent on self-stimulatory responses. For example, a child who engaged in hand-flapping might be required to practice functional hand exercises on command from the teacher for a period of 15 minutes.

Maintaining and Generalizing Behavioral Gains

Every teacher hopes that what has been taught will not be quickly forgotten--that there will be response maintenance. Most teachers hope also for transfer of training or generalization; that is, they like to think that what they have taught will be practiced in situations other than the classroom or specific setting in which the learner's new skill was acquired; that there will be stimulus generalization, and that the person they have taught will learn some related behaviors in addition to the specific skills for which instruction was given, that there will be response generalization. For example, a teacher who teaches a child how to answer the telephone in the classroom in May will be especially happy to find that the child still answers appropriately in September, that the child answers the phone properly at home, and that related skills, such as responding to instructions given via telephone, have been learned without special instruction.

In truth, there is relatively little research indicating how response maintenance and transfer of training (generalization) can best be facilitated. It does seem rather clear that responses are unlikely to be maintained and training is not likely to transfer to new settings and responses unless specific procedures are used. Unless the teacher goes beyond wishful thinking and deliberately devises a program to make these desirable outcomes occur, maintenance and transfer are not likely to happen (Kazdin, 1975). Several procedures for facilitating maintenance and generalization have been suggested, but the use of these procedures is today supported more by appeal to common sense and extrapolation from laboratory research than by research with humans. The following techniques are suggested as those consistent with the best current thinking (see Kazdin, 1975, for more complete discussion).

Gradually Fading Out Contingencies

In a sound behavior management program, reinforcement and punishment are contingent on specific performances, as we have discussed previously. If contingencies are suddenly dropped, and performance is no longer followed by reinforcement or punishment as in the past, then the individual is likely to perform poorly. The normal individual who finds that a certain desirable response no

longer pays off will soon stop performing that response, and the person who no longer suffers negative consequences for inappropriate behavior is likely to regress rather quickly. Of course, there are ways to make behavior resistant to extinction (durable in the absence of frequent consequences), and we will discuss some of them. The point here is simply that removing all the supports (contingencies) for behavior at once is an unintelligent way of managing behavior if one wants it to endure. It makes better sense to withdraw contingencies gradually. If one has devised contingencies that apply to ten behaviors, then it would be advisable to remove the contingencies one at a time, allowing the person to adjust to the absence of one contingency before withdrawing the next. Or if a contingency is in effect 12 hours per day, then it would be prudent to withdraw the contingency for an hour at first and later for longer periods, but only for as much time as the individual will tolerate without losing behavioral gains.

Gradually Increasing Delay of Consequences

An axiom of behavior modification is that behavior is most responsive to its immediate consequences. To some extent, however, it is advantageous to teach individuals to work for delayed rewards or to behave well in order to avoid delayed punishment. In our society, delayed rewards (or the promise of them), often maintain behavior over a long period of time. (Consider the person working for years to obtain an academic degree or saving money for years to purchase a house). It is unreasonable to expect the severely handicapped, who typically require immediate consequences for learning, suddenly to tolerate long delays in being rewarded for appropriate performance. One must be careful to begin with very slight delays in administering consequences and then gradually lengthen the response-consequence interval. For example, if token reinforcers are being given, they initially may be redeemable for back-up reinforcers immediately after 5 minutes of work, but exchanging them may be put off for gradually longer intervals until eventually they are cashed in at the end of the day.

Gradually "Leaning" the Schedule of Reinforcement

Continuous reinforcement, reinforcement of every proper response, usually is necessary in order to establish a skill that is being learned. Once a response is established, however it can be maintained more efficiently, in most cases, through an intermittent schedule in which only a fraction of the responses are reinforced. The greater the number of responses and/or the more time that must pass before reinforcement is given, the leaner or thinner the schedule. Responses are unlikely to be maintained if suddenly a rich (continuous or nearly continuous) schedule becomes very *lean* (thin). The astute teacher will gradually wean students by thinning out reinforcement in small steps.

Shifting to Natural Reinforcers

Some reinforcers are considered to be contrived or artificial because they do not ordinarily or naturally occur in the person's environment. Tokens, points, and certain activities that can be used as reinforcers are not natural or automatic consequences for behavior in an unmanaged environment. It is reasonable to expect that responses will have a better chance of being maintained and generalized to new settings if the reinforcers supporting those responses are automatic (e.g., food in the mouth for self-feeding) or part of normal social intercourse (e.g., praise and attention). It is often necessary to use artificial reinforcers to establish responses in the severely handicapped, but it is wise to pair natural reinforcers (e.g., praise) with contrived rewards (e.g., tokens) and to work toward reliance on consequences that are likely to occur in the child's everyday life without a teacher's being there to program them.

Varying the Training Setting

A common complaint about training the severely handicapped is that they learn a skill in one setting, perhaps the classroom, but cannot perform the task in another setting, perhaps on the job or at home. Certainly, it is true that training cannot be expected to generalize across different settings by magic. One way of increasing the chances of accomplishing generalization across settings is to provide

training in a variety of situations and under a variety of conditions, with the situations and conditions being as close as possible to the real life settings to which it is hoped generalization will occur. A pragmatic view is that, whenever possible, training should be given in the settings where performance will actually be called for.

Training the Person's Caretakers

The teacher usually is not in a position to follow a learner's progress over a period of many years or to see to the student's care after school hours. Therefore, it is advisable to train parents, siblings, or others who manage the individual's behavior outside the classroom. In fact, if response maintenance and generalization are to be realities, training the person's caretakers in methods of behavior management is usually essential. Training programs for parents and nonprofessionals are readily available (cf. Baldwin & Fredericks, 1973; Larsen & Bricker, 1968).

Teaching Self-Control

Persons who are not severely handicapped have been taught a variety of self-control techniques including counting and graphing their own behavior, giving themselves instructions, and applying consequences for their own behavior. Self-control techniques may facilitate maintenance of behavior because there is less reliance on external sources of motivation. The extent to which severely handicapped individuals can be taught to be self-controlled has not been researched extensively, but it seems a worthy goal for every person to develop self-control to the greatest extent possible.

The seven techniques suggested here are not mutually exclusive. In fact, many of the techniques are complementary. For example, consequences may be gradually delayed at the same time that contingencies of reinforcement are being faded out. The task of the teacher of the severely handicapped is to employ these seven techniques, and perhaps others as well to ensure maintenance and generalization of learning, rather than leaving the outcome to chance.

References

Ausman, J. O., & Gaddy, M. R. Reinforcement training for echolalia: Developing a repertoire of appropriate verbal responses in an echolalic girl. Mental Retardation, 1974, 12(1), 20-21.

Azrin, N. H., Gottlieb, L., Hughart, L., Wesolowski, M. D., & Rahn, T. Eliminating self-injurious behavior by educative procedures. Behavior Research and Therapy, 1975, 13, 101-111.

Azrin, N. H., Kaplan, S. J., & Foxx, R. M. Autism reversal: Eliminating stereotyped self-stimulation of retarded individuals. American Journal of Mental Deficiency, 1973, 78, 241-248.

Azrin, N. H. & Wesolowski, M. D. Theft reversal: An overcorrection procedure for eliminating stealing by retarded persons. Journal of Applied Behavior Analysis, 1974, 7, 577-581.

Bachman, J. A. Self-injurious behavior: A behavioral analysis. Journal of Abnormal Psychology, 1972, 80, 211-224.

Baer, D. M., & Guess, D. Teaching productive noun suffixes to severely retarded children. American Journal of Mental Deficiency, 1973, 77, 498-505.

Baer, D. M., Peterson, R. F., & Sherman, J. A. Building on imitative repertoire by programming similarity between child and model as discriminative for reinforcement. Paper presented at the biennial meeting of the Society for Research in Child Development Minneapolis Minn., March 1965.

Baker, J. G., Stanish, B., & Fraser, B. Comparative effects of a token economy in nursery school. Mental Retardation, 1972, 10(4), 16-19.

Baldwin, V. L. & Fredericks, H. D. Isn't it time he outgrew this? Or a training program for parents of retarded children. Springfield, Ill.: Charles C. Thomas, 1973.

Balthazaar, E., & Stevens, H. The emotionally disturbed mentally retarded. Englwood Cliffs, N.J.: Prentice-Hall, 1975.

Barton, E. S., Guess, D. Garcia, E., & Baer, D. M. Improvement of retardates' mealtime behaviors by timeout procedures using multiple baseline techniques. Journal of Applied Behavior Analysis, 1970, 3, 77-84.

Bellamy, T., & Buttars, K. L. Teaching trainable level retarded students to count money: Toward personal independence through academic instruction. Education and Training of the Mentally Retarded, 1975, 10, 18-26.

Bostow, D. E. & Bailey, J. B. Modification of severe disruptive and aggressive behavior using brief timeout and reinforcement procedures. Journal of Applied Behavior Analysis, 1969, 2, 31-37.

Cooper, J. O. Measurement and analysis of behavior techniques. Columbus, Ohio: Charles E. Merrill, 1974.

Crosson, J. E. A Technique for programming sheltered workshop environments for training severely retarded workers. American Journal of Mental Deficiency, 1969, 73, 814-818.

Dalton, A. J., Rubino, C. A., & Hislop, M. W. Some effects of token rewards on school achievement of children with Down's syndrome. Journal of Applied Behavior Analysis, 1973, 6. 251-259.

Dorry, G. W., & Zeaman, D. Teaching a simple reading vocabulary to retarded children: Effectiveness of fading and nonfading procedures. American Journal of Mental Deficiency, 1975, 79, 711-716.

Epstein, L. H., Doke, L. A., Sajwaj, T. E., Sorrell, S., & Rimmer, B. Generality and side effects of overcorrection. Journal of Applied Behavior Analysis, 1974, 7, 385-390.

Foxx, R. M., & Azrin, N. H. The elimination of autistic self-stimulatory behavior by overcorrection. Journal of Applied Behavior Analysis, 1973, 6, 1-14.

Foxx, R. M., & Azrin, N. H. Restitution: A method of eliminating aggressive-disruptive behavior of retarded and brain damaged patients. Behavior Research and Therapy, 1972, 10, 15-27.

Foxx, R. M., & Martin, E. D. Treatment of scavenging behavior (coprophagy and pica) by overcorrection. Behavior Research and Therapy, 1975, 13, 151-162.

Frankel, F., & Simmons, J. Q. Self-injurious behavior in schizophrenic and retarded children. American Journal of Mental Deficiency, 1976, 80, 512-522.

Garcia, E. The training and generalization of a conversational speech form in nonverbal retardates. Journal of Applied Behavior Analysis, 1974, 7, 137-149.

Gold, M. W. Stimulus factors in skill training of the retarded on a complex assembly task: Acquisition transfer and retention. American Journal of Mental Deficiency, 1972, 76, 517-526.

Guess, D., & Baer, D. M. An analysis of individual differences in generalization between receptive and productive language in retarded children. Journal of Applied Behavior Analysis, 1973, 6, 311-329.

Hall, R. V. Managing behavior. Part I. Behavior modification: The measurement of behavior. Lawrence, Kansas: H & H Enterprises, 1971.

Hall, R. V., Axelrod, S. Foundopulos, M., Shellman, J. Campbell, R. A., & Cranston, S. S. The effective use of punishment to modify behavior in the classroom. Educational Technology, 1971, 11(4), 24-26.

Hall, R. V., Hawkins, R. P., & Axelrod, S. Measuring and recording student behavior: A behavior analysis approach. In R. A. Weinberg & F. H. Wood (Eds.), Observation of pupils and teachers in mainstream and special education settings: alternate strategies. Minneapolis Minn.: Leadership Training Institute, University of Minnesota, 1975.

Hislop, M. W., Moore, C., & Stanish, B. Remedial classroom programming: Long-term transfer effects from a token economy system. Mental Retardation, 1973, 11(2), 18-20.

Horner, R. D., & Keilitz, I. Training mentally retarded adolescents to brush their teeth. Journal of Applied Behavior Analysis, 1975, 8, 301-319.

Karen, R. L., Eisner, M., & Endres, R. W. Behavior modification in a sheltered workshop for severely retarded students. American Journal of Mental Deficiency, 1975, 79, 338-347.

Kauffman, J. M. Nineteenth century views of children's behavior disorders: Historical contributions and continuing issues. Journal of Special Education, in press. (a)

Kauffman, J. M. Characteristics of behavior disorders in children. Columbus, Ohio: Charles E. Merrill, in press. (b)

Kauffman, J. M., LaFleur, N. K., Hallahan, D. P., & Chanes, C. M. Imitation as a consequence for children's behavior: Two experimental case studies. Behavior Therapy, 1975, 6, 535-542.

Kazdin, A. E. Behavior modification in applied settings. Homewood, Ill.: Dorsey Press, 1975.

Kazdin, A. E., & Bootzin, R. R. The token economy: An evaluative review. Journal of Applied Behavior Analysis, 1972, 5, 343-372.

Koegel, R. L., Firestone, Frieman, J., Spoering., K., & Fehrenbacher, J. Comparison of three procedures in reducing self-injurious children. Journal of Applied Behavior Analysis, 1974, 7, 521-523.

Larsen, L. A., & Bricker, W. A. A manual for parents and teachers of severely and moderately retarded children. Nashville, Tenn.: Institute on Mental Retardation and Intellectual Development IMRID Papers and Reports, 5(22), 1968.

Lucero, W. J., Frieman, J., Spocring., K., & Fehrenbacher, J. Comparison of three procedures in reducing self-injurious behavior. American Journal of Mental Deficiency. 1976, 80, 548-554.

MacMillan, D. L., Forness, S. R., & Trumbull, B. M. The role of punishment in the classroom. Exceptional Children, 1973, 40, 85-96.

Nelson, G. L., Cone, J. E., & Hanson, C. R. Training correct utensil use in retarded children: Modeling vs. physical guidance. American Journal of Mental Deficiency. 1975, 80, 114-122.

O'Brien, F., & Azrin, N. H. Developing proper mealtime behaviors of the institutionalized retarded. Journal of Applied Behavior Analysis, 1972, 5, 389-399.

O'Brien, F., Azrin, N. H., & Bugle, C. Training profoundly retarded children to stop crawling. Journal of Applied Behavior Analysis, 1972, 5, 131-137.

O'Brien, F., Bugle, C., & Azrin, N. H. Training and maintaining a retarded child's proper eating. Journal of Applied Behavior Analysis, 1972, 5, 67-72.

Peterson, R. A., & McIntosh, E. I. Teaching tricycle riding. Mental Retardation, 1973, 11(5), 32-34.

Repp, A. C., & Deitz, S. M. Reducing aggressive and self-injurious behavior of institutionalized retarded children through reinforcement of other behaviors. Journal of Applied Behavior Analysis, 1974, 7, 313-325.

Sachs, D. A., The efficacy of time-out procedures in a variety of behavior problems. Journal of Behavior Therapy and Experimental Psychiatry, 1973, 4, 237-242.

Salzberg, B., & Napolitan, J. Holding a retarded boy at a table for 2 minutes to reduce inappropriate object contact. American Journal of Mental Deficiency, 1974, 78, 748-751.

Skinner, B. F. The technology of teaching. New York: Appleton, 1968.

Streifel, J. A., & Phelan, J. G. Use of reinforcement of behavioral similarity to establish imitative behavior in young mentally retarded children. American Journal of Mental Deficiency, 1972, 77, 239-341.

Sulzbacher, S. I., & Houser, J. E. A tactic to eliminate disruptive behaviors in the classroom: Group contingent consequences. American Journal of Mental Deficiency, 1968, 73, 88-90.

Vukelich, R., & Hake, D. F. Reduction of dangerously aggressive behavior in a severely retarded resident through a combination of positive reinforcement procedures. Journal of Applied Behavior Analysis, 1971, 4, 215-225.

Webster, D. R., & Azrin, N. H. Required relaxation: A method of inhibiting agitative-disruptive behavior of retardates. Behavior Research and Therapy. 1973, 11, 67-78.

White, O. R., & Liberty, K. A. Behavioral assessment and precise educational measurement. In N. G. Haring and R. L. Schiefelbusch (Eds.) Teaching Special Children. New York: McGraw-Hill, 1976.

White, G. D., Nielsen, G., & Johnson, S. M. Timeout duration and the suppression of deviant behavior in children. Journal of Applied Behavior Analysis, 1972, 5, 111-120.

Wolf, M. M., Birnbrauer, J. S. Williams, T., & Lawler, J. A note on apparent extinction of the vomiting of a retarded child. In L. P. Ullmann & L. Krasner (Eds.), Case studies in behavior modification. New York: Holt, Reinhart, & Winston, 1965.

Worell, J. & Nelson, C. M. Managing instructional problems: A case study workbook. New York: McGraw-Hill, 1974.

Zimmerman, J. & Zimmerman, E. The alteration of behavior in a special classroom situation. Journal of the Experimental Analysis of Behavior, 1962, 5, 59-60.

Instructor Materials: Transparencies

The following transparencies should be used as an outline for the instructor's lecture notes and discussion. When using a transparency, it is best to cover all of it with a paper except for the point being discussed. Furthermore, the print should be large and easy to read. Multi-colored transparencies are the most readable. It should be noted that there are a number of transparencies which are also in the Systematic Instruction Module. The instructor who wants a comprehensive treatment of behavioral principles will want to consider using these transparencies as well.

Behavior Log Form

Transparency A

Target behavior_____

Observer's name_____

Child observed_____

Date	Time		Antecedents	Consequences	Applied interventions	Comments
	Begins	Ends				

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Positive Reinforcement

1. Definition: a (positive) event or consequence which makes a behavior increase

2. Reinforcement Contingency: relationship between behavior and positive consequences following it;

   Example:

   - If Jo stays awake, then she can leave 15 minutes early.

   - If Debbie comes to class everytime, then she does not have to take the final quiz.

3. Selection of Reinforcers:

   a. Observe child and record material and activity preference

   b. Trial-and-error

   c. Reinforcement menu

Considerations in Using Positive Reinforcement (Rf)

1. Immediacy
2. Schedule
3. Amount
4. Pairing
5. Proximity
6. Labeling
7. Expressiveness

Term 1:

Immediacy - Providing Rf immediately after child responds correctly

a. How quickly? 1-2 seconds when a new skill is being taught

b. Why? So child can rapidly associate correct response with positive consequence

Example of Incorrect Rf: Toilet Training

1. Child is put on toilet
2. Child eliminates.
3. Aide comes into bathroom to talk with teacher.
4. Child picks nose.
5. Ten seconds later aide leaves and teacher reinforces child.
6. Child associates Rf with picking his/her nose.

Term 2

Schedule -

How often child gets Rf for a correct response

a. **Continuous - Every correct response gets Rf.**

b. **Intermittent - Child's correct responses are reinforced periodically.**

c. **When is a continuous schedule best?**

- **When teaching a new skill**
- **When is an intermittent schedule best?**
- **When child has reached criterion and teacher wants to reduce Rf for maintaining responses only**

Example of continuous Rf:

Each correct response is reinforced by teacher when the response is made

Term 3

Transparency E

Pairing -

Giving two reinforcers at about the same time

Examples:

1. **Child eliminates in toilet**
   a. **Fruitloop given**
   b. **Praise and hug**
2. **Child completes 10 minutes of on-task work**
   a. **Token given**
   b. **Praise given**
3. **Child self-initiates on Jack-in-the-box toy**
   a. **Jack-in-the-box pops up**
   b. **Teacher and peers applaud**

- **When reinforcers are paired, one strengthens the other**
- **It is a good way to reduce use of food as a reinforcer**

Term 4

Proximity -

Showing child the reinforcer or putting it in child's view.

Example -

Increasing work production rate

1. **Teacher selects reinforcer (red lifesaver).**
2. **Teacher begins work with Rf in front of child.**
3. **Child meets criterion.**
4. **Child receives Rf.**

Caution! -

This can boomerang if child goes berserk over food

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Term 5

Labeling -

Telling child why he/she is being reinforced.

Why?

Many severely involved children will think they are being reinforced for something other than what the teacher perceives

Example: Sitting in seat

1. **Child is sitting quietly but looking at peers fighting in corner**

2. **Teacher says to child: "Good job of sitting in your seat, Johnny!"**

Term 6

Expressiveness - Getting excited and showing verbal and facial responses to child's correct actions:

- **"Way to go!"**
- **"Thats great, Ellen!"**
- **"Tremendous!" "Far Out!"**

What happens if you don't do this consistently with severely, profoundly, multi-handicapped individuals?

a) **Social reinforcement is ineffective.**

b) **Children must rely on food and liquids for Rf.**

Expressive social reinforcement is HARD WORK. It may take awhile to get over an initial feeling of foolishness, but it is an important reinforcer.

Teaching Skills

1. Give clear instructions first and to the point.
2. Next use modeling with instructions.
3. Finally use physical guidance.

Prompting - providing physical or verbal assistance.

Fading - gradual removal of assistance as person becomes proficient at skill.

Backward Chaining vs. Forward Chaining

Amount of Practice

Feedback

Attention

Coding

Instructional Model in Implementing Task Analysis

I. Present material to child

(variables include: number of trials, length of trial, type of instruction, model, or assistance used, amount of material presented, 1:1 or small group, etc.)

II. Child

a) Responds correctly

b) Responds incorrectly

c) Does not respond

III. If response is correct, a positive consequence may be given (variables include: feedback, food, praise, immediacy of reinforcement, etc.)

If not, repeat training sequence

General Guidelines

1. <u>Define Behavior</u> -

   a. take one skill at a time

   b. get behaviors which can be seen and counted

2. <u>Measure Behavior</u> -

   a. count or time-sample level of behavior before beginning treatment program
      This is a BASELINE

   b. why? to find out the extent and degree of problem

3. <u>Select Realistic Goals</u> -

   a. write an objective which defines conditions, criterion, and observable behavior

Transparency L

Steps in Setting Up a Behavior Management Program

1. Define behavior to be modified
2. Measure behavior
3. Set realistic goals
4. Select behavioral change procedure
5. Implement and monitor effectiveness
6. Evaluate progress

Behavior Analysis

1. Does the behavior occur frequently enough to be considered a problem?

   Yes_____ No_____

2. Where does the behavior occur?
   Are there specific situations, times, or staff that "set-off" the child?_____
   _____
   _____

3. When does the behavior occur?_____
   _____

   (Is there a particular time, such as late in the day, in which the child displays the inappropriate behavior?)

4. What happens after the child acts inappropriately?_____
   _____

Time Out Guidelines

Transparency N

*Administer in unemotional manner

*Be firm when removing child

*Be consistent

*Make time out area void of reinforcement

*Keep stay short

*Reinforce alternative behaviors

*Inform student of contingency

*Involve others - associate

Safeguards

Use term "quiet room"
Provide adequate lighting and carpeting
Remove dangerous objects
Set timer
Use as a last resort
Obtain parents' informed consent
Explain program to visitors
Document program effectiveness

Time-Out Log

Transparency O

Child _____

Teacher _____

Date _____

Time		Behavior before time-out	Behavior during time-out	Behavior after time-out
Enters	Leaves			

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Potential Problems with Time Out

Negative Contingency (teacher paired with negative)

Suppression of Other Behaviors (discipline problems)

Nonconstructive Contingency

Individual may Adapt

Consistent Enforcement

Interferes with Learning

Legal Sanctions

Overuse

OVERCORRECTION

Definition: Individual must accept responsibility of misbehavior by restoring a setting or situation to a state vastly improved from that existing prior to the disruption; extended practice may be required.

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Basic Components Involved in Overcorrection

1. Tell child he/she is behaving inappropriately
2. Stop the child's ongoing activity
3. Provide clear instructions to child
4. Force practice of desired behavior
5. Return child to an ongoing activity

Remember:

1) To be effective, positive reinforcement for not being bad should be used with overcorrection

2) Careful records should be kept of progress

Overcorrection: Examples

Problem Behavior	Overcorrection Treatment
1. High rate of non-compliance; refusal to follow instructions	1. Extended practice on target instructions; student must practice doing instruction 15-20 times at the point of non-compliance
2. Head weaving, finger flicking and other self-stimulation	2. Functional hand training; student must hold hands in an up position (2 min), out position (2 min), down position (2 min); this should be repeated twice at point of stereotypic behavior

3. Repeated toilet accidents, feces smearing, or chronic regurgitation

3. Positive practice clean-up; area must be completely cleared, mouth cleaned thoroughly

Instructor Materials: Worksheet Answer Keys

Positive Reinforcement No. 2 - Key

1. Yes; Scolding
2. Yes; Yes; Attention; Yes
3. Yes; Kiss; Behavior continues to occur
4. Yes; Attention; Giggling
5. Smiling and picking up child; Attention; Yes

Discriminative Stimulus No. 3 - Key

1. "What is your name?"
2. When someone came through the door
3. I
4. II
5. "What is your name?"
6. When someone came through the door
7. Someone comes through the door
8. Lewis is asked his name and responds correctly
9. The question asked
10. Yes

Punishment Procedures No. 8 - Key

1. Smoking; More smoked; Yes
2. Verbal reprimand; Yes
3. Tardiness; No

Generalization No. 12 - Key

1. S.G.
2. S.G.
3. R.G.
4. S.G.
5. S.G.

Participant Materials: Worksheets

IDENTIFYING BEHAVIORS AND CONSEQUENCES

Work Sheet No. 1

People are taught to behave the way they do. Most of what we learn, we learn from other people. Children can learn to be friendly. When psychologists speak of "social learning" they are referring to people teaching each other. When people learn, they change. Child rearing and education are devoted to changing learners.

(1) HOW TO TEACH (OR CHANGE LEARNERS)

The single most important factor in learning a behavior is what happens immediately following the behavior. We will call what happens immediately following a behavior a **CONSEQUENCE**. Here are some examples:

Terry pushes the peddle on a tricycle and the tricycle moves.

BEHAVIOR - pushes peddle

CONSEQUENCE - tricycle moves

Shawn builds a house of blocks and is praised by the teacher.

BEHAVIOR - builds house

CONSEQUENCE - praise

Bobby blows a toy trumpet and produces a loud sound.

BEHAVIOR - blows toy trumpet

CONSEQUENCE - loud sound

Johnny cries and is picked up by his mother.

BEHAVIOR - cries

CONSEQUENCE - picked up by mother

EXERCISE: Identify the behavior and the immediate consequence in the following examples.

Robert opens a book and sees a colorful picture.

BEHAVIOR

CONSEQUENCE

Susan moves her paint brush across the paper and leaves a pretty red line.

BEHAVIOR

CONSEQUENCE

Kara asks for a cookie and is given one by her mother.

BEHAVIOR _____

CONSEQUENCE _____

Jimmy turns a knob on the T.V. and a picture appears on the screen.

BEHAVIOR _____

CONSEQUENCE _____

EXERCISE: Now write several of your own examples based upon the students from your classroom. Identify each behavior and its immediate consequence.

BEHAVIOR _____

CONSEQUENCE _____

BEHAVIOR _____

CONSEQUENCE _____

BEHAVIOR _____

CONSEQUENCE _____

POSITIVE REINFORCEMENT

Work Sheet No. 2

Positive reinforcement is the procedure of following a desired behavior with a positive consequence in order to strengthen that behavior. If the consequence is positively reinforcing, the behavior will be more likely to occur again in the future.

To hypothesize that something is positively reinforcing to an individual (1) a stimulus event (reinforcer) must be presented and (2) the stimulus presentation should *follow* the behavior that you desire to increase or maintain.

As an example, a baby emits the phonemes "dada." Immediately after this response occurs, the father picks the child up, cuddles and kisses the child, and varies his facial expression. In the future, the rate of phonemes "dada" increases. We could hypothesize that at least something the father presented (kisses, hugs, etc.) was a reinforcer to the child. (This can only be hypothesized and in this stage not confirmed since we lack scientific verification.)

Exercises

1. Burt fell down the stairs after which his mother scolded him. In the future he began to fall down the stairs more and more often, and each time his mother scolded him. Could you hypothesize that something is reinforcing his falling down behavior? What?

2. Rebecca spends a certain amount of her time out of her seat in school. Each time she is found out of her seat, the teacher guides her back to her seat and reprimands her. Lately she has been getting out of her seat more and more often. Could you hypothesize that the process of positive reinforcement of out of seat behavior is taking place? Is a reinforcer being presented? What is it? Does the stimulus follow the increased behavior?

3. Every time Jim sits down to read the newspaper after dinner, his wife comes to him and gives him a kiss. Could you hypothesize that positive reinforcement is taking place? What is it? How do you know?

4. Alexandria giggles during class. The teacher puts a "dunce hat" on her and makes her sit on the "dunce stool." Alexandria continues to giggle. Could you hypothesize that the process of positive reinforcement is taking place? What reinforcer is presented? Which behavior is increased?

5. Each time the baby smiles at his mother, the mother picks him up and cuddles him. What behavior and what response would you expect to increase in the future? What is the presented reinforcer? Does the reinforcer follow the behavior you wish to maintain?

DISCRIMINATIVE STIMULUS

Work Sheet No. 3

A discriminative stimulus (S^D) is an antecedent event which comes before a behavior occurs. This discriminative stimulus signals the time and place at which certain behaviors are likely to result in certain consequences.

An example is mother saying "Come to dinner." Her child, Horatio, then goes to the table to eat. The antecedent event is mother saying "Come to dinner," which tells the time and place or S^D for Horatio to go to the table for food.

An S^Δ (S-delta) is a stimulus which is consistently present when responses are not reinforced.

The absence of normal reinforcement from a vending machine after inserting several coins acts as a S^Δ. You know further responding would be to no avail so you no longer put your coins in the machine.

Exercises:

During phase I a twenty-five year old semi-verbal male in a residential treatment center was taught through a shaping procedure to say "My name is Lewis." Each day there were twenty minutes of training during which he was reinforced each time he emitted the response. The therapist was eager for Lewis to learn the response, so he reinforced him with edibles and praise under two conditions when the response was emitted: (1) when the question, "What is your name?" was asked; and (2) when an aide or other person came through the door of the training room. This, however, precipitated a difficulty. On the ward, Lewis would rush to anyone who came in and offer the unsolicited information. It was decided that this behavior was not one which would be considered appropriate if the patient were in a non-institutional environment, thus a Phase II program was initiated during the training period. Lewis was reinforced for the correct response when he was asked his name, but was ignored when he offered the information voluntarily to entering individuals who had not asked. Within a few days Lewis answered appropriately when asked but did not offer his name under any other condition. Further social verbal skill training was then commenced.

During Phase I of the training, the stimulus conditions under which the response was reinforced were (1)____ and (2)____. When the strength of a response is different under different stimuli, the response is said to be under stimulus control. During Phase (3)____ there was no evidence to suggest there was stimulus control. During Phase (4)____, however, Lewis responded differentially to the two stimuli, (5)____ and (6)____: Therefore, there is some evidence for stimulus control by the stimulus. In Phase II, the response is no longer reinforced when (7)____, but continues to be reinforced when (8)____. In Phase II (9)____ was an SD for saying "My name is Lewis." Discrimination is a special case for stimulus control. When a response has been extinguished in the presence of one stimulus and maintained in the presence of another, a discrimination has been developed. Would you say that discrimination training could have taken place in the above example? (10)____

TRAINING PROFICIENCY SCALE

Work Sheet No. 4

A. Shaping Behavior

1. Gets the subject's attention.

Prior to giving a command, simple or complex, it is necessary for the student to be paying attention to the trainer. Otherwise the command will be wasted. An attempt must be made to find an effective method to obtain and hold the person's attention. Several methods may be used: calling child's name, clapping your hands or snapping your fingers, showing the reinforcers, etc.

Poor	Good
Poor trainers might call a name in a low voice, or give a command while the person is walking around the room or attending to other objects.	Good trainers use effective methods to gain attention. Students usually stop what they are doing and listen for a command. Eye contact is a good indicator that the person is attending.

2. Determines the operant level.

At the beginning of a training session (before any skill is taught) it is to the trainer's advantage to determine the operant level. For example, if a child knows how to remove a pullover shirt and does this on command, it would be very time-consuming and unnecessary for the trainer to go through the various teaching steps. However, if the trainer has been told that this particular child can take off his or her shirt and the child does not, the usual routine of training may be necessary - apparently this person is not under verbal control, which is necessary in teaching new behavior.

Poor	Good
Poor trainers often neglect determining the operant level for many skills. They proceed to teach every skill to every person whether he or she knows it or not.	Good trainers determine the operant level for all skills which they plan to teach. This is done before demonstrating the desired behavior, and with a minimum of cues or prompts.

3. Demonstrates the desired behavior.

In order for a child to learn a new behavior it should be clearly demonstrated to him or her. The trainer, in teaching taking off a shirt, must remove the shirt for the child while repeating the command, "Johnny, take off your shirt!" emphasizing the word "off." The trainer must be certain that the child sees the desired behavior and hears the correct command before being expected to repeat the task.

Poor	Good
Poor trainers to too fast and do not demonstrate the behavior. Often they do not wait until the person is attending before they demonstrate the particular behavior.	Good trainers demonstrate the desired behavior simultaneously giving the command and rewarding the child. They wait until the person is attending before demonstrating.

4. Starts with the correct step.

This immediately follows the demonstration of the desired behavior. For example, in backward chaining, the first step taught is the last component step done, i.e., the act which completes the behavior. When putting on a T-shirt, the last component of the skill is pulling the hem of the shirt down to the waist. This, then, is the first step to teach and should be followed immediately with a reward. Of course, the first step will be dependent on the individual's level of ability and previous training.

Poor	Good
Poor trainers often begin at the wrong step, which is either too difficult or too easy for the student.	Good trainers begin at the correct step and proceed from there.

5. Uses the proper sequence of steps.

Progress is made faster if the proper sequence of steps is followed. In addition, training by more than one trainer is made possible when similar training procedures are followed. For any skill or behavior there are many components. Teaching each one successively increases the child's chances of succeeding and learning usually occurs much faster. It is important to gauge how large the step increments should be for any person.

Poor	Good
Poor trainers treat every person the same. No consideration is given to changing the size of the step increments. Often proper order of steps is forgotten.	Good trainers use the proper sequence of steps and adjust them according to the individual needs of each child.

6. Proceeds to the next step when the subject is ready.

After the student has learned the first step of any skill and is able to repeat the step without a physical prompt, the next step can be undertaken. This next step will depend on the person's ability to learn. For example, while one child may be able to throw a ball after a few attempts, another may have to advance to throwing slowly. (Item No. 6 differs from the previous item in that here the rater should be concerned with the proper timing, while in item No. 5 the emphasis is on the knowledge of the steps involved.)

Poor	Good
Poor trainers usually proceed too fast or too slowly and students either fail or become distracted.	Good trainers proceed at an effective pace. Students make steady progress in learning each new skill.

7. Returns to previously successful step if necessary.

Three areas should be considered if a student has learned one step after another and then suddenly will not follow through with the next step: (1) Is the reinforcement strong enough? (2) Is the person feeling well? (3) Has the person's tolerance level in this session been reached? A fourth possibility is that the particular step increment is too large for the person to succeed. If this is the case, the trainer should return to a previously successful step (the one immediately preceeding the failed step), allow the person to repeat it, reward him or her, and then proceed to the next step, perhaps using smaller increments this time.

Poor	Good
Poor trainers often fail to return to earlier steps and continue to command the person despite continuing failures.	Good trainers will return to a previously successful step when other possibilities for poor performance have been ruled out.

B. **Rewarding**

8. Finds an effective reward.

The importance of finding an effective reward is obvious. The more effective a reward is, the more a child will work for it - in fact, the measure of a reward's effectiveness is the effort which a person puts out to get it. In the beginning of a training session primary reinforcements are usually the most effective forms of rewards. Later, social reinforcement can be substituted.

Poor	Good
Poor trainers usually use the same rewards with all students and don't experiment until they find the most effective one.	Good trainers usually have a number of different rewards and are prepared to find the most effective one. This is usually determined before training starts.

9. Gives the reward quickly.

Learning requires that the response and the reinforcement occur in close temporal proximity - that is, they occur closely together. This means that the reward should follow the desired response as quickly as possible - one to two seconds is a good estimate.

Poor	Good
Poor trainers usually fumble with the rewards, dropping them, forgetting to give them, and giving them slowly.	Good trainers usually have their rewards close at hand and give them quickly and smoothly.

10. Gives verbal reinforcement enthusiastically.

Retarded children experience little success, so accentuating what success they do make is important. Verbal reinforcement (eg. "Good work") should be given in a dramatic fashion. It must also be given in conjunction with the primary reinforcement (food) and serves as a "bridging signal" between the response and the reward. In other words, it is sometimes difficult to give the primary reinforcement immediately after the response: however, it is almost always possible to praise the child. This way, verbal praise becomes associated with the primary reinforcement and later can be used in its place.

Poor	Good
Poor trainers are apt to forget to give verbal reinforcement, or give it in a mechanical manner.	Good trainers have a flair for dramatics. Verbal praise is given with changes in loudness and tone, with much inflexion.

11. Gives verbal reinforcement with primary reinforcement.

As noted above (Item No. 20) it is important that verbal praise be given immediately after the response, so it can serve as a bridging signal. Verbal praise can then be used instead of treats since it has been associated with them in the past. This is an important step in the child's development because it represents the acquisition of a basic receptive vocabulary.

Poor	Good
Poor trainers often forget to give praise, or if they do, the delay between praise and the treat is too long. Sometimes the praise follows the treat instead of coming before it.	Good trainers give praise immediately after the desired response and before the treat.

12. Gives physical reinforcement enthusiastically.

Most retarded children like physical contact (though there are exceptions). For most children it is very effective to give physical reinforcement by patting them softly on the back, rubbing their backs, giving them a short swing, etc. Like verbal reinforcement, it should be given with the primary reinforcement. In short, you try to reward the child in as many ways as possible at the same time, with a treat, by praise and with physical contact. Always, individual differences between children must be taken into account.

Poor	Good
Poor trainers often forget to give physical reinforcement, or give it mechanically.	Good trainers give physical reinforcement initially following every desired response.

13. Gives physical reinforcement with primary reinforcement.

As in the case of praise (Item Nos. 10 & 11) it is important that physical reinforcement be associated with the primary reinforcement. In those cases where the physical contact is already reinforcing to the child this presents no problem. In cases where the child is afraid of physical contact, association with primary reinforcement is essential. Without physical contact, training is very difficult, and adjustment to everyday life situations is impossible.

Poor	Good
Poor trainers often forget to give physical reinforcement, or the delay between the physical contact and the treat is too long.	Good trainers give physical contact immediately after the desired response, and in conjunction with praise. Both are given before the treats.

14. Uses the bridging signal in chaining.

Once a child is responding to verbal praise, it can be substituted for treats. In a simple task, like asking a child to sit down in a chair on the other side of the room, one can first ask the child to "Come to me" then give praise ("Good boy or girl") followed by the next command "Sit over there" (pointing to the chair) and then give the treat for the completed response. This chain looks like:

"Good Boy or Girl"
"Come to me" - - - - - "Sit over there"

"Good Boy or Girl" plus treat

Here the verbal praise has been used in a situation which before had required the treat. Of course, the time to begin using praise in establishing chains of responses will differ with each child.

Poor	Good
Poor trainers will begin using praise in chaining too early or too late. Sometimes they never even use it.	Good trainers use praise and substitute it once responses have been well established. Usually the child reacts normally to this change when it is introduced correctly.

15. Changes the reward if necessary.

Sometimes in the middle of a training session the child becomes increasingly distractible and stops working. There may be a number of causes for this (Item No. 7), one of which may be that the reward is no longer effective. Retarded children, like the rest of us, become tired of the same thing - this is called satiation. If this is the case, a variety of rewards should be tried.

Poor	Good
Poor trainers usually don't remember this important variable and end a session before considering it.	Good trainers take all of the possible reasons for poor performance into consideration.

16. Withholds reinforcement correctly.

It is important to decide what the desired response will be before starting. This way it is clear what responses will be rewarding and which will not. For example, in taking off a pullover shirt, the first response may be holding the shirt. When the child does this he or she is rewarded. The next response would be holding the shirt and pulling it off the end of the arm. Now the child is not rewarded for just holding the shirt. Reinforcement must be withheld until the desired response occurs. If it does not, it is usually appropriate to say "No" to the child and then repeat the command. Removing the reward from his or her sight with the word "No" is often effective. As always, you should be sure that the step which you are requiring is not too great for the child.

Poor	Good
Poor trainers are hesitant to withhold rewards. Often they forget to say "No" or to remove the reward from sight when the child is not responding appropriately.	Good trainers correctly withhold the reward when the child doesn't respond correctly. They always inform the child by saying "No" and removing the reward from sight momentarily.

17. Gives reinforcement correctly.

Of course, it is vital that reinforcement be given correctly. A child is rewarded when he/she emits a desired behavior. As has been said, there are individual differences between children and in the same child from time to time. This means that the trainer must adjust that response to the conditions of the training session. Nonetheless, the child must be rewarded for desired responses, and must not be rewarded for undesirable behaviors. A trainer should be able to justify each reward given a child according to the goals of a particular training session.

Poor	Good
Poor trainers sometimes reward inappropriate behaviors, or they forget to reward the appropriate responses.	Good trainers know what responses to expect and reward them when they occur. They do not reward inappropriate or undesirable behaviors.

C. Communicating

18. Uses the correct emphasis in commands.

It is often difficult for retarded children to understand words. There may be little difference for the child between the words "Take off your shirt" and "Put on your shirt." For this reason it is beneficial to emphasize the action words "off" and "on" in the above case.

Poor	Good
Poor trainers generally speak in a mechanical manner not emphasizing any words in particular, or they emphasize the wrong words - "Take off *your* shirt."	Good trainers have that dramatic flair and use it to accentuate the important words in each command.

19. Uses correct verbal commands.

In order to allow different trainers to work with the same child and not create difficulties in transfer of training, a standard language should be used. This makes it much easier for the patient. For example, if one trainer says "Take off your shirt" while another says "Give me your blouse" the child is likely to get confused.

Poor	Good
Poor trainers often use different commands during the same training session.	Good trainers generally use a standard language in all situations with all children; however, they will vary the language when it becomes necessary.

20. Uses student's name before command.

Not only is it important to use the proper standard language emphasizing the important words, but it is also necessary to introduce commands with the child's name. This is one effective way of getting his or her attention. Otherwise the command is wasted since it may have been completed before the child was listening. This also can serve as an important learning process for the child, where every command reinforces a rudimentary self-concept. Initially it is sometimes necessary to train a child to respond to his or her own name.

Poor	Good
Poor trainers often make the mistake of putting the child's name after the command.	Good trainers always use the child's name first.

21. Gives correct gesture.

Sometimes it is not enough to give a retarded child a command. When commands are not sufficient they should be accompanied by gestures. If you are asking Johnny to "Come to me" and he has not responded to the verbal command, it is helpful to use your arms and hands and gesture. This is particularly useful when working on dressing skills and you are using the same word (shirt, pants) in giving commands which may call for opposite actions (off, on). It is very important that the gesture be given simultaneously with the command.

Poor	Good
Poor trainers either do not use gestures or use them incorrectly. Sometimes they are given after the command, or they are not sufficiently dramatic to be effective.	Good trainers first determine whether a gesture is necessary, and if so, use it correctly, simultaneously with the command, and with sufficient dramatization.

22. Uses physical prompts effectively.

When commands plus gestures have not worked, and the child is still not obeying a simple command, it may be necessary to physically move the child's body and limbs, and then use reinforcement. In asking a child to "Sit down" you may at first have to sit him/her down by pushing down on his/her shoulders. Similarly, in dressing, an occasional move of the arm may be necessary to get a child started.

Poor	Good
Poor trainers use physical prompts incorrectly by too much or too little emphasis. Sometimes they do not even use them at all.	Good trainers use physical prompts when commands and gestures have failed. They use sufficient emphasis to produce the behavior without irritating the child.

23. Fades physical prompts correctly.

Physical prompts may be necessary to initiate a skill but they are rarely necessary for long periods of time. In addition, they may be time-consuming. The sooner a physical prompt is eliminated the faster training progresses. Physical prompts are correctly faded by gradually reducing the physical assistance given by the trainer. Initially it may be necessary to put both arms on Johnny's shoulders to sit him down; then, maybe one arm. Later it may be enough to put your arm to his shoulder to get him to sit. It is very important that the physical prompts be removed gradually.

Poor	Good
Poor trainers usually do not fade physical prompts, but rather stop using them abruptly.	Good trainers gradually fade the physical prompt providing a smooth transition.

24. Fades gestures correctly.

Once physical prompts have been faded, and the child is responding consistently, gestures can also be eliminated. Remember, the goal is to have the child under verbal control. As with physical prompts, gestures are not simply dropped, they are gradually reduced. Usually this amounts to going from large movements to smaller movements.

Poor	Good
Poor trainers usually stop the gestures abruptly.	Good trainers gradually decrease the size of gestures.

D. **Rapport and Miscellaneous**

25. Gets acquainted before training.

A training session is an intimate interpersonal relationship between the student and trainer. This is important to keep in mind. Much of the success in training will be related to the

feeling which the child has toward the trainer. Since the training session may be new to the child, you should first become acquainted. Let the child walk around the room. Touch him or her. Let him or her touch you. Once the child is relaxed in the situation you can begin training.

Poor	Good
Poor trainers begin training as soon as the patient enters the room.	Good trainers take time to get acquainted before training. The first session may be devoted only to this.

26. Shows adequate patience during training.

A training session can be a very tiring experience for the trainer as well as the child. Sometimes everything goes well, and sometimes it doesn't. When it doesn't, the trainer often becomes irritable and loses patience with the child.

Good	Poor
Good trainers stay calm in most situations, and know when it is time to end the session.	Poor trainers often lose their patience and become irritated.

27. Handles children respectfully.

Retarded children are like any other human beings and deserve to be treated with respect. Respect can be shown in various ways: in your voice, in the way you touch a child, in the things you say, etc. Pushing or shoving a child, referring to him or her in derogatory names, yelling, etc. are indications of a lack of respect for the child as a person.

Poor	Good
Poor trainers are likely to call a student names, dislike physical contact, etc.	Good trainers treat the student as another human being.

28. Properly ignores inappropriate behavior.

Often in a training session a child responds negatively. Misbehavior may occur in a variety of ways: by throwing objects, screaming, banging head, spitting, soiling, etc. It is usually best to ignore this behavior because paying attention might reinforce these responses, and the behavior would continue.

Poor	Good
Poor trainers are overconcerned with misbehavior. Training is constantly stopped to reprimand the student.	Good trainers ignore most bad behavior unless it becomes absolutely necessary to terminate a session.

29. Prepares room correctly before training.

The environment in which training occurs is also an important factor to be taken into consideration. If you plan to work on dressing skills it makes sense that you have clothes in the room before you begin, or at least, that you bring them in with the child. It is also important to have whatever props you may need, such as a chair, table, etc. Any distractions should be eliminated if possible.

Poor	Good
Poor trainers get the child and then think about what they need. Their rooms are often filled with unnecessary distractions, without the proper rewards, props, etc.	Good trainers prepare their rooms before beginning, and have the right props, a variety of rewards on hand, and have eliminated as many distractions as possible.

30. Trains one task at a time.

Retarded students learn slowly, and it is important for the trainer to be persistent. It may be necessary to work at one skill for a long time before the child begins to respond properly. For this reason trainers should generally work on one skill at a time, since this increases the student's chances of success.

Poor	Good
Poor trainers skip from one task to another.	Good trainers work on one task until the child has experienced success.

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ANTECEDENT - BEHAVIOR - CONSEQUENCE ANALYSIS

Work Sheet No. 5

A	B	C	Long Term Effects
Grooming time in the bathroom; one staff member and four residents present.	Carmen, one of the girls in the bathroom, runs out the door.	Teacher runs after her and says, "Carmen, come back here." Takes her by the arm and leads her back to bathroom.	Carmen is likely to run out of the bathroom more often when that teacher is around, because of all the attention she received for running out.
Residents are eating one of their meals in the dining room.	Jeanette holds up an empty glass and utters, "mm", "mm", "mm".	Mary, the teacher, takes the glass and fills it with milk and takes it to Jeanette.	Jeanette is more likely to make the same noise and hold up her glass at future meals.
Lori (a resident) and one of the teachers are in the office. Lori has been "bugging" the teacher and the teacher says, "Lori, please leave now and close the door."	Lori, while still standing in the office asks, "Do you like me?"	Teacher says, "Yes, I like you; now please leave the office." Following which Lori asks a few questions which the teacher answers. Finally, Lori leaves.	Lori is more likely to be persistent and say, "Do you like me" when she is told to do something, because she has just been reinforced by teacher attention for persistence.
Grooming time in bathroom.	A resident has just completed all grooming steps without help from the staff.	Staff member says, "Good for you John", and hands the resident a token reinforcer.	Resident is more likely to emit the desirable grooming behavior in the future because of the attention given for his behavior.
Resident sees a staff member with a box of candies.	Resident begins to scream "Candy, candy."	To terminate the screaming, the staff member gives the screaming resident a piece of candy.	Staff member is more likely to "give in" to the screaming resident in the future, and the resident is more likely to scream when seeing a candy box.
Feeding time for four students at your table - all of which can feed themselves.	Paul, one of the boys, is not eating because he chooses not to lift his own spoon.	Teacher decides to feed Paul as other three boys are almost done and dietary employees are anxious to finish work.	Paul is likely to delay and be lazy again.
Free time on ward for residents. Kids are walking around dayroom.	Terry, a boy who should use a walker when walking, does so while going from one end of dayroom to the other.	Staff member notices Terry using walker and says, "Good boy, Terry, it's great you're using your walker."	Terry is reinforced by the approval. Likely to use walker again to gain favorable comment.

A	B	C	Long Term Effects
Dressing program for residents in the morning; one staff member present and five residents.	Mark, who has been in training for several weeks, enters training room early and dresses himself almost completely without being told by teacher to "begin dressing" and without waiting for others.	Teacher enters room and sees that Mark has been there for awhile before official dressing time. She scolds him for entering early without permission.	Teacher has not responded or reinforced Mark's own effort. Mark's initiative has been dealt a severe blow. He will likely not be as cooperative in the dressing program in the immediate future.

A FRAMEWORK FOR ORGANIZING AND CONDUCTING A PROGRAM IN BEHAVIOR CHANGE

Work Sheet No. 6

I. **Clearly specify a mutually agreeable terminal behavior in operational terms.**
   A. Specify what the student is to do.
   B. Specify observable and measurable behaviors.

II. **Observe and record the behavior as it is typically emitted.**
   A. Train key individuals (or trainees) to observe and record data.
      1. Give initial practice.
      2. Allow for adaptation when necessary.
      3. Graph data.
      4. Discuss results.
   B. Importance.
      1. Serves as a standard against which changes can be measured.
      2. Enhances objectivity.

III. **Select a criterion level.**
   A. The criterion level should be mutually agreeable to all.
   B. Include several behavioral dimensions.
      1. Frequency.
      2. Situation or location.
      3. Topography.
      4. Intensity.

IV. **Select and clearly specify a behavior change procedure.**
   A. Identify and perhaps, record the naturally occurring consequential events (A-B-C).
      1. During operant data collection.
      2. By discussing the matter with the trainers, attendants, etc.

V. **Assure a favorable environment.**
   A. Ensure that the environment will not interfere with or prevent desired terminal behaviors from occurring.
   B. Ensure that the selected behavior procedure(s) will be consistently employed.

VI. **Confer with student (optional but desirable).**
   A. Discuss behavioral contact or desired terminal behavior and how student might be helped to get there.
   B. Importance.
      1. Student becomes actively involved.
      2. Student is more likely to be able to discriminate what s/he should be doing from what is undesirable.

VII. **Monitor and evaluate the behavior change program.**
   A. Encourage a continuation of data collection.
      1. Greater objectivity
      2. Immediate and constant feedback
   B. Select and use an appropriate experimental design (optional).

VIII. **Follow-up and maintain the behavior change.**
   A. Plan for in advance.
   B. Have periodic contacts with key personnel.
   C. Make a periodic observation of student's behavior.
   D. Use appropriate behavioral maintenance procedures.

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BEHAVIOR MANAGEMENT PROBLEMS
Work Sheet No. 7

1. Samantha is a severely retarded child who just turned three years old. She started to wear glasses , but two weeks after getting them she began to throw them. Within a few days she was throwing her glasses on the average of three times per day. Her parents were upset by this not only because her vision without the glasses was poor and she often bumped into furniture, people, the family car, etc., but it was also becoming quite expensive to constantly repair the broken frames and lenses. How would you refrain Samantha from throwing her glasses in the future by using behavior principles?

2. Sandra is a five year old girl with normal intelligence. Her parents believe she is suffering from depression because she never plays with the other children in the neighborhood. Sandra rarely speaks at home or at school, and is highly withdrawn. Sandra's parents are afraid she is very sick or even mentally ill. What strategy would you undertake to help Sandra overcome her "depression"?

3. Steve is 19 years old. He body rocks and head weaves constantly. These inappropriate behaviors interrupt his ability to learn in the classroom and his teacher is concerned about getting them under control. What management suggestions might you provide?

4. Mary is 10 years old and throws up three to four times a day. Her teacher and nurse are convinced she has a stomach disorder but the psychologist thinks she probably does it for attention. How could you find out? What strategies might be employed if it was for attention?

PUNISHMENT PROCEDURES

Work Sheet No. 8

(Time-Out, Response Cost, Overcorrection, Extinction)

Punishment is the process of presenting something unpleasant or *aversive* immediately following a response. If the punisher presented is *aversive* to the individual, the punished response will decelerate.

To hypothesize whether or not a punisher is aversive, present it following an inappropriate behavior and record its effects on the behavior. (i.e., if the behavior decreases, a punisher for the individual has been identified).

Aversive stimuli used can be:

1. Primary - slaps, drugs, shock
2. Secondary - "No," frowns, gestures

As an example, a two-year old child is found playing with matches. The mother enters and slaps the child's hand while saying "No."

In the future, when matches are accessible to the child, the child does not play with them. We would hypothesize that at least something the mother presented (i.e., slap, "No," etc.) was a punisher for the child.

Exercise:

1. Chris (five years) was found smoking a cigarette in the basement of his house by his father. The father forced Chris to finish smoking the cigarette and have five more. Subsequently, Chris became ill and was never again found smoking. What is the behavior being punished?_____ What is the punishing event?_____ Was it effective?_____

2. During a free reading period in the classroom, the teacher told Herby to be quiet four times. During the next class, Herby was reprimanded twice, and the following class, Herby was quiet the entire period. Identify the punisher._____ Was it effective?_____

3. Jennifer had been tardy (i.e., late for school) for two weeks straight. One morning, the teacher told her that she was going to have to remain after school to make up for the time she missed that morning. The next day, Jennifer was ten minutes late for class. What behavior was punished? _____ Was the punisher effective?_____

Time-Out

Time-out (TO) is a procedure of temporarily removing the child from a reinforcing situation following inappropriate behavior and placing him/her in a location in which reinforcement is minimal or unlikely to occur. If effective, the TO procedure will decelerate the inappropriate responses.

Variables which should be considered when using a TO procedure and when selecting an appropriate TO setting include: (a) administration of TO should be performed in a nonemotional matter-of-fact manner; (b) insure that removal of child from situation is in fact unpleasant; (c) be consistent; (d) location of TO setting should be void of possible positive reinforcement for the individual; (e) keep TO period as short as possible; (f) inform child which inappropriate behaviors result in time-out; and (g) reinforce alternative behaviors; (h) careful records should be kept; (i) reinforcer which is maintaining inappropriate behavior should be identified; (jj) students should be allowed to take their own time-out if they are able to.

Example:

During a kindergarten play period Kevin became disruptive and was sent to the time-out room, which was located outside of his classmates' vision. Following a three minute TO period, Kevin was allowed to reenter the group. Soon after, Kevin's teacher told Kevin how he was now playing appropriately. Points to be noted from this example are: (1) the placement of Kevin in the TO room

contingent upon his disruptive behavior; (2) the location of the TO room (outside of classmates vision); (3) the short time period necessary for TO; and (4) the teacher's verbal reinforcement of Kevin's appropriate play (i.e., alternative behavior).

In other instances of TO, the source of reinforcement is removed following inappropriate behavior. For example, a potential TO procedure for messy eating would be to remove the child's food tray for a short period of time.

Supplementary Readings-Time-out:

Brown, G.O. and Tyler, V.O., Jr. Time-out from reinforcement: A technique for dethroning the "duke" of an institutionalized delinquent group. JOURNAL OF PSYCHOLOGY' PSYCHIATRY' AND ALLIED DISCIPLINE' 1968, Vol. 9, pp. 209-212.

Gast, D., & Nelson, C. Time-out in the classroom: implications for special education. EXCEPTIONAL CHILDREN, 1977, Vol. 43, No. 7, pp. 461-463.

Martin, R. and Berndt, L.A. The effects on stuttering in a 12-year old boy. EXCEPTIONAL CHILD 1970, Vol. 37, pp. 303-304.

Response Cost

Response Cost is an additional variation of the TO procedure. Following inappropriate behavior, the individual loses a reinforcer. Privileges, freedom, money or an opportunity to go to the gym may be forfeited. This procedure again involves the removal or loss of reinforcing events and has the effect of decreasing the frequency of occurrence of the preceding behavior which resulted in this consequence.

As an example, a factory worker who arrives late to punch-in at the time clock is "docked" six minutes pay for each minute of being late.

Supplementary Readings - Response Cost:

Perline, I. H. and Levinsky, N. Controlling maladaptive classroom behavior in the severely retarded. AMER. J. OF MENTAL DEFICIENCY, 1968, Vol. 73, pp. 74-78.

Buchard, J. D. and Barrea, F. An analysis of time-out and response cost in a programmed environment. JABA, 1972, Vol. 5, pp. 271-282.

Kazdin, A. G. Response cost: the removal of conditioned reinforcers for therapeutic change. BEHAVIOR THERAPY, 1972, Vol. 3, pp. 533-541.

Overcorrection

Overcorrection becomes an extended over-dramatization of appropriate behavior that should replace the inappropriate or misbehavior of the offender. Positive practice is one form of overcorrection. This procedure forces the individual to perform an appropriate behavior several times in succession to overlearn the behavior. Restitution, another form of over-correction, requires the individual to overly make up for a disturbance in the environment that was caused by the individual.

An example of positive practice: A child is caught running down the hall. The teacher requires the child to walk up and down the hall ten times.

An example of restitution: A child who wets his pants and subsequently messes the floor is required to clean up the floor and wash his clothes.

Supplementary Readings - Over-correction:

Foxx, R. M. and Azrin, N. H. Restitution: a method of eliminating aggressive-disruptive behavior of retarded and brain damaged patients. BEHAVIOR RESEARCH AND THERAPY, 1972, Vol. 10, pp. 15-27.

Azrin, N. H. and Nunn, R. G. Habit reversal: a method of eliminating nervous habits and tics. BEHAVIOR RESEARCH AND THERAPY, 1973, Vol. 11, pp. 619-628. (example - positive practice)

Rusch, F. & Close, D. Overcorrection: a procedural evaluation. AAESPH REVIEW, 1976, Vol. 1, No. 5.

Extinction

Operant extinction is the procedure of no longer reinforcing a specific response. Once the reinforcing events which serve to maintain a response are no longer contingent upon the response, the response will decrease in frequency of occurrence. Frequently when an extinction procedure has been initiated a temporary increase in response rate occurs. How severe this increase is depends upon the specific past reinforcement history of that response. However, if the extinction procedure is used consistently the behavior will in fact decrease to zero or a near zero response rate.

Example

Terry whines and cries every night before she goes to bed. Her mother then submits to letting her fall asleep watching TV. Terry's father disagrees with this sleeping arrangement and finally decides to step in. The next night when Terry cries and whines, he puts her in bed anyway. She cries for an hour before finally falling asleep. The next couple of nights her crying lasts for 45, 17 and three minutes respectively. Since the fourth night, there has been no occurrence of the crying and whining behavior.

PROBLEM ANALYSIS SHEET: JERRY

Work Sheet No. 9

Jerry is a 17 year old resident at State School for the Mentally Retarded who has recently been assigned through the Vocational Rehabilitation counselor to the upholstery shop. Jerry is "good with his hands," and has dabbled in painting, pottery, and has tinkered with cars. Since Jerry is a recent admission, the counselor felt that a nice quiet shop where Jerry could work on repairing the school furniture might be a good assignment for him. He reads a lot and is very cooperative around the ward.

Although he likes the young social worker very much and sees her three times a week, Jerry is still a little nervous over the entire state school routine, and has had some difficulty in the shop. He usually gets to the shop late in the morning, and spends most of his day in the bathroom or at the water cooler. He's constantly looking up at the clock, and asking everyone "What time is it?" and "What time do we finish here?".

Mr. Miles who is the shop instructor keeps telling Jerry to get on the ball and to get back to work. He's tried reasoning with Jerry, telling him of his deadlines, quotas, and back orders, but this has had no effect on Jerry. Mr. Miles has even kept Jerry back from his lunch until he has completed a portion of a job, but this hasn't changed Jerry much. Mr. Miles has recently started chasing Jerry out of the shop whenever he sees him goofing off. Now, Jerry is even slower than before and is doing less work.

1. What is the behavioral problem(s)?

2. What might the staff be doing, that is enhancing Jerry's behavior in the shop? List at least two reasons for his present behavior.

   a.

   b.

3. What would you suggest (at least two) that the staff do to change his behavior in the shop?

   a.

   b.

PROBLEM ANALYSIS SHEET - RICHARD

Work Sheet No. 10

Richard is a seven year old profoundly retarded child who has also been labeled autistic. He runs wildly around the room, refuses to eat, will pull things off the wall or upset materials in the room and is nonverbal. He has limited self-help skills. He lives with his grandmother who wants to institutionalize him.

1. What is the behavioral problem(s)?

2. Could the teacher be maintaining Richard's problems? How? List at least two reasons for his behavior:

   a.

   b.

3. What might the teacher do to overcome these problems?

PROBLEM ANALYSIS SHEET - CHERYL

Work Sheet No. 11

Cheryl is a ten year old severely retarded girl who is self-abusive. She picks skin off her forehead and also pulls her hair out when agitated or frustrated. It has reached a point where the teacher puts gloves on her for most of the day. Her parents have been advised by their doctor to institutionalize her.

1. What is the behavioral problem(s)?

2. Could the teacher be maintaining Cheryl's problems? How? List at least two possible reasons for her behavior.

   a.

   b.

3. What might the teacher do to overcome this problem?

GENERALIZATION

Work Sheet No. 12

Stimulus generalization - Stimulus generalization refers to the generalization or transfer of a response to situations other than those in which training takes place. If a response reinforced in one situation or setting also increases in other settings, although not reinforced in those settings, this is referred to as stimulus generalization. Situations or stimuli which are similar generalize more rapidly than situations which are highly dissimilar or opposite. The opposite of generalization can be viewed as discrimination. One example of generalization in dressing skills would be that of a child who has learned to button a sweater also being able to button a jacket without training or reinforcement. This would be a transfer of training from the sweater to a jacket.

Response generalization - Response generalization occurs when the reinforcement of a response increases the probability of other similar responses occurring. In some behavioral programs the effect of modifying one behavior will also affect other behaviors as well. For example, if a person is reinforced for smiling, the frequency of laughing and talking might also increase. Another example of response generalization would be that of reinforcing one target behavior of playing with outdoor play equipment, and having other non-reinforced behaviors such as touching and talking with other children increase.

1. Mark SG for stimulus generalization and RG for response generalization:
   Mary has learned three colors, red first, then orange, and then green. She learned orange much quicker than green. This is an example of_____

2. John has learned to go to the bathroom at home and school. He can now use the bathroom in the restaurant, as well. This is an example of_____

3. Debbie has been getting special privileges from her parents for the last month for keeping her room clean. Her parents also notice that now she does her homework on time, and does not stay out as late anymore. This is an example of_____

4. Lawrence has recently taken a course in the Department of Psychology in behavioral applications to education. He is presently taking the Behavior Modification course in the Dept. of Behavioral Disabilities and is doing very well. This is an example of_____

5. Barb works in a grocery store and received a raise for excellent work. Her supervisor notices she laughs more now, and is willing to work overtime. This is an example of_____

Participant Materials: Handouts

GLOSSARY

ABAB Design--See Reversal Design.

Alternate Response Training--A technique used in therapy (as desensitization) and as a self-control strategy in which the individual is trained to engage in a response (e.g., relaxation) which interferes with or replaces another response which is to be controlled or eliminated.

Aversive Event--A stimulus which suppresses a behavior it follows or increases a behavior which results in its termination.

Avoidance--Performance of a behavior which postpones or averts the presentation of an aversive event.

Back-up Reinforcer--An object, activity, or event (primary or secondary reinforcer) that can be purchased with tokens. Those reinforcers which "back up" the value of the tokens.

Baseline--The frequency of the behavior prior to initiating a behavior modification program. The rate of performance used to evaluate the effect of the program. Operant rate of behavior. Initial phase of reversal, multiple-baseline, and changing-criterion designs.

Behavior--Any observable and measurable response or act of an individual. (The terms "behavior" and "response" are used synonymously.)

Behavior Control--Exerting power or influence over others by altering the environmental contingencies to achieve a definite end.

Chain--A sequence of behaviors that occurs in a fixed order. Each behavior in the chain serves as a discriminative stimulus (SD) for the next response. Also each behavior in the chain (except the first behavior) serves as a conditioned reinforcer which reinforces the previous response.

Chaining--Developing a sequence of responses in a backward order. The terminal response in the chain is developed first. The next to the last response is trained second. Remaining responses are trained in the reverse order of their performance once the chain is finally performed. Developing a complex behavior by training individual components of the behavior in a backward fashion.

Changing-Criterion Design--An experimental design in which the effect of the program is evaluated by repeatedly altering the criterion for reinforcement or punishment.

Classical (or Respondent) Conditioning--A type of learning in which a neutral (conditioned) stimulus is paired with an unconditioned stimulus which automatically elicits a reflex response. After repeatedly following the conditioned stimulus with the unconditioned stimulus, the conditioned stimulus alone will elicit a reflex response. In classical conditioning new stimuli gain the power to elicit respondent behavior.

Conditioned Aversive Stimulus--An event which is initially neutral may acquire aversive properties by virtue of being paired with other aversive events or a signal that no reinforcement will be forthcoming.

Conditioned Reinforcer--See Secondary Reinforcer.

Conditioned Response--A reflex response elicited by a conditioned stimulus alone in the absence of

the unconditioned stimulus. It resembles, but is not identical to, the unconditioned response. See Classical Conditioning.

Conditioned Stimulus——A previously neutral stimulus which through repeated associations with an unconditioned stimulus elicits a reflex response. See Classical Conditioning.

Contingency——The relationship between a behavior (the response to be changed) and the events (consequences) which follow behavior. Sometimes events which precede the behavior are also specified by a contingency.

Contingency Contracts——A behavior modification program in which an agreement or contract is made between individuals who wish behavior to change (e.g. parents) and those whose behavior is to be changed (e.g. their children). The contract specifies the relationship between behavior and the consequences which will follow.

Contingent Delivery of a Reinforcer——The delivery of a reinforcer only when a specified behavior has been performed. Contrast with Non-contingent Delivery of a Reinforcer.

Continuous Reinforcement——A schedule of reinforcement in which a response is reinforced each time it is performed.

Control Group Design——An experimental design in which the effect of the program is evaluated by comparing (at least) two groups, a group which receives the program and another group which does not receive the program.

Coverant——A private event such as a thought, fantasy, or image which is not "observable" to anyone other than the individual to whom it is occurring. Private events can be viewed as responses which can be altered by varying the consequences which follow them. "Coverant" is a contraction of "covert" and "operant."

Covert Event——A private event such as a thought, fantasy, or image. See Coverant.

Cue——See Discriminative Stimulus (S^D).

Delay of Reinforcement——The time interval between a response and delivery of the reinforcer.

Deprivation——Reducing the availability of or access to a reinforcer.

Differential Reinforcement——Reinforcing a response in the presence of one stimulus (S^D) and extinguishing the response in the presence of other stimuli (S^-). Eventually the response is consistently performed in the presence of the S^D but not in the presence of the S^-.

Differential Reinforcement of Other Behavior (DRO)——Delivery of a reinforcer after any response *except* the target response. The individual is reinforced only when he or she is not performing the target response. Behaviors other than the target response are reinforced. The effect of a DRO schedule is to decrease the target (unreinforced) response.

Discrimination——Responding differently in the presence of different cues or antecedent events. Control of behavior by discriminative stimuli. See Stimulus Control.

Discriminative Stimulus (S^D)——An antecedent event or stimulus which signals that a certain response will be reinforced. A response is reinforced in the presence of an S^D. After an event becomes an S^D by being paired with reinforcement, its presence can increase the probability that the response will occur.

Elicit——To automatically bring about a response. Respondent or reflex behaviors are elicited by unconditioned stimuli. Contrast with Emit and Operant Behavior. See Classical Conditioning.

Emit——To perform a response spontaneously. An emitted response is not automatically controlled by stimuli which precede it. Operant behaviors are emitted. They are controlled primarily by the consequences which follow them. Contrast with Elicit and Respondent. See Operant Conditioning.

Escape——Performance of a behavior which terminates an aversive event.

Experimental Design——The plan of the program which determines how the effect of the experimental contingency will be causally demonstrated. The plan to evaluate whether the behavior modification program rather than various extraneous factors was responsible for behavior change.

Extinction——A procedure in which the reinforcer is no longer delivered for a previously reinforced response.

Extinction Burst——An increase in the frequency and intensity of responding at the beginning of extinction.

Fading——The gradual removal of discriminative stimuli (S^D) including prompts such as instructions or physical guidance. Initially, developing behavior is often facilitated by prompts. Yet is important in most situations to *fade* the prompt. Fading also can refer to the gradual removal of reinforcement as in the progressive thinning of a reinforcement schedule.

Fixed-interval Schedule——A schedule of administering reinforcement. In an FI schedule, the first occurrence of the target response after a fixed time interval elapses is reinforced.

Fixed-ratio Schedule——A schedule of administering reinforcement. In an FR schedule, an unvarying number of occurrences of the target response is required for reinforcement.

Functional Relationship——A relationship between the experimental condition or contingency and behavior. A functional relationship is demonstrated if behavior systematically changes when the contingency is applied, withdrawn, and reapplied.

Generalized Conditioned Reinforcer——A conditioned reinforcer that has acquired reinforcing value by being associated or paired with a variety of other reinforcers. Money is an example of a generalized conditioned reinforcer.

Group Contingencies——Contingencies in which the group participates. There are two major variations: (1) An individual's behavior can determine the consequences delivered to the group; (2) the behavior of a group as a whole determines the consequences that the group (each member) receives.

High Probability Behavior——A response which is performed with a relatively high frequency when the individual is given the opportunity to select among alternative behaviors. See Premack Principle.

Incompatible Behavior——Behavior that cannot be performed at the same time as or that interferes with another behavior.

Intermittent Reinforcement——A schedule of reinforcement in which a response is not reinforced every time it is performed. Only some occurrences of the response are reinforced.

Interval Schedule of Reinforcement——A schedule in which reinforcement is delivered on the basis of

the amount of time that passes before a response can be reinforced. Contrast with Ratio Schedule of Reinforcement.

Medical Model——A view which specifies that psychological symptoms or maladaptive behavior are caused by underlying processes which are "diseased." The underlying psychological "disease" must be treated before overt behavior can be changed.

Modeling——See Observational Learning.

Multiple-Baseline Designs——Experimental designs which demonstrate the effect of a contingency by introducing the contingency across different behaviors, individuals, or situations at different points in time. The effect of the contingency is demonstrated without a reversal phase.

Multiple-Baseline Design Across Behaviors——An experimental design in which baseline data are gathered across two or more behaviors. The experimental contingency is applied to the first behavior while baseline conditions are continued for the other behaviors. After all behaviors have stabilized, the contingency is introduced for the second behavior. This is continued until the experimental contingency is applied to all target behaviors at different points in time. A casual relationship between the experimental contingency and behavior is demonstrated, if each behavior changes when and only when the contingency is introduced.

Multiple-Baseline Design Across Individuals——An experimental design in which baseline data are gathered across two or more individuals. The experimental contingency is applied to the first individual while baseline conditions are continued for the other individuals. After behavior has stabilized for all individuals, the contingency is introduced for the second individual. This is continued until the experimental contingency is applied to all individuals at different points in time. A causal relationship between the experimental contingency and behavior is demonstrated, if each individual's behavior changes when and only when the contingency is introduced.

Multiple-Baseline Design Across Situations——An experimental design in which baseline data are gathered across two or more situations. The experimental contingency is applied to behavior in the first situation while baseline conditions are continued for the behavior in the other situations. After behavior has stabilized in each situation, the contingency is introduced for behavior in the second situation. This is continued until the contingency is applied to all situations at different points in time. A causal relationship between the experimental contingency and behavior is demonstrated, if behavior in each situation changes when and only when the contingency is introduced.

"Naturally Occurring" Reinforcers——Those reinforcing events in the environment which are not contrived but are usually available as part of the setting. Attention, praise, completion of an activity, and mastery of a task are some events which are "naturally occurring" reinforcers.

Negative Reinforcement——An increase in the frequency of a response which is followed by termination or removal of a negative reinforcer. See Negative Reinforcer.

Negative Reinforcer——An aversive event or stimulus which when terminated increases the frequency of the preceding response. The increase in frequency of the response which terminates or removes the aversive event is called negative reinforcement.

Noncontingent Delivery of a Reinforcer——The delivery of a reinforcer independently of behavior. The reinforcer is delivered without reference to how the individual is behaving. Contrast with Contingent Delivery of a Reinforcer.

Observational Learning——Learning by observing another individual (a model) engage in a behavior. To

learn from a model, the observer need not perform the behavior nor receive direct consequences for his/her performance.

Occasion——To increase the likelihood that a response is performed by presenting an S^D. Certain cues in the environment (e.g., music) occasion certain responses (e.g., singing).

Operant Behavior——Emitted behavior that is controlled by its consequences.

Operant Conditioning——A type of learning in which behaviors are altered primarily by regulating the consequences which follow them. The frequency of operant behaviors is altered by the consequences which they produce.

Operant Rate——See Baseline.

Overcorrection——A punishment procedure which consists of two components. First, the environmental consequences of the undesirable behavior must be corrected (e.g., cleaning up a mess). Second, correct forms of desirable behavior must be thoroughly rehearsed or practiced (e.g., cleaning up messes made by several other people).

Overt Behavior——Behavior that is publicly observable and measurable. Contrast with Covert Event.

Positive Reinforcement——An increase in the frequency of a response which is followed by a positive reinforcer. See Positive Reinforcer.

Positive Reinforcer——An event which, when presented, increases the probability of a response it follows.

Premack Principle——A principle that states that of any pair of responses or activities in which an individual freely engages, the more frequent one will reinforce the less frequent one.

Primary Reinforcer——A reinforcing event which does not depend on learning to achieve its reinforcing properties. Food, water, and sex are primary reinforcers. Contrast with Secondary Reinforcer.

Prompt——An antecedent event which helps initiate a response. A discriminative stimulus which occasions a response. Instructions, gestures, physical guidance, and modeling cues serve as prompts.

Psychodynamic View——An explanation of personality which accounts for behavior by positing underlying psychological forces. The behavior of an individual is traced to psychological drives, impulses, or personality dynamics.

Punishment——Presentation of an aversive event or removal of a positive reinforcer contingent upon a response which decreases the probability of that response.

Ratio Schedule of Reinforcement——A schedule in which reinforcement is delivered on the basis of the number of responses which are performed. Contrast with internal schedule of reinforcement.

Reinforcement——An increase in the frequency of a response when the response is immediately followed by a particular consequence. The consequence can be either the presentation of a positive reinforcer or removal of a negative reinforcer.

Reinforcer Sampling——A case of response priming where the purpose is to develop or increase utilization of an event as a reinforcer. The individual is provided with a sample or small portion of the event which increases the likelihood that the entire event can serve as a reinforcer.

Reliability of Assessment——The consistency with which different observers working independently score a target response. Reliability can be calculated with different methods depending upon the method used to assess behavior (i.e., frequency, interval, or duration methods). The calculation of reliability yields a percentage of agreement between observers.

Resistance to Extinction——The extent to which a response is maintained once reinforcement is no longer provided.

Respondent——Behavior that is elicited or automatically controlled by antecedent stimuli. Reflexes are respondents because their performance automatically follows certain stimuli. The connection between unconditioned respondents and antecedent events which control them is unlearned. Respondents may come under the control of otherwise neutral stimuli through classical conditioning.

Response Cost——A punishment procedure in which a positive reinforcer is lost or some penalty is invoked contingent upon behavior. Unlike time-out, there is no specified time limit to the withdrawal of the reinforcer. Fines represent a common form of response cost.

Response Generalization——Reinforcement of one response increases the probability of other responses which are similar to and resemble the target response. Contrast with Stimulus Generalization.

Response Priming——Any procedure which initiates early steps in a sequence of responses. Response priming increases the likelihood that the terminal behavior in a sequence of responses will be performed by initiating early responses in the sequence.

Reversal Design——An experimental design where the target behavior of a subject or group of subjects is assessed to determine baseline performance. After a stable rate of behavior is shown, the experimental condition is introduced until behavior changes. A reversal phase follows where the program is withdrawn. Finally, the experimental condition is reintroduced. A functional relationship is demonstrated if behavior changes in each phase in which the experimental condition is presented and reverts to baseline or near baseline levels when it is withdrawn. Also called an ABAB design.

Reversal Phase——A phase in the reversal design in which the program is withdrawn or altered to determine whether behavior reverts to baseline or near baseline levels. During a reversal phase one of three changes usually is made: (1) the program is withdrawn, (2) the consequences are delivered noncontingently, or (3) the consequences follow a DRO schedule.

Satiation——Providing an excessive amount of reinforcer. A loss of effectiveness that occurs after a large amount of the reinforcer has been delivered.

Schedule of Reinforcement——The rule denoting how many responses or which responses will be reinforced.

S^D——See Discriminative Stimulus.

S ——An antecedent event or stimulus which signals that a certain response will not be reinforced.

Secondary (or Conditioned) Reinforcer——An event which becomes reinforcing through learning. An event becomes a secondary reinforcer by being paired with other events (primary or conditioned) which are already reinforcing. Praise and attention are examples of secondary reinforcers. Contrast with Primary Reinforcer.

Self-Administered Reinforcement——Refers to the individual delivering the reinforcer to him or herself.

Self-Control——Refers to those behaviors an individual deliberately undertakes to achieve self-selected outcomes by manipulating antecedent and consequent events.

Self-Determined Reinforcement——Refers to the individual specifying the criteria for reinforcement.

Self-Instruction——A self-control technique in which an individual prompts his or her own behavior by providing covert self-instructions or statements which direct and guide performance.

Self-Observation——Assessing or recording one's own behavior. Sometimes used as a self-control technique.

Self-Punishment——Providing oneself with punishing consequences contingent upon behavior.

Self-Reinforcement——Providing oneself with reinforcing consequences contingent upon behavior. To qualify as self-reinforcement, the individual must be free to partake of the reinforcer at any time whether or not a particular response is performed.

Shaping——Developing a new behavior by reinforcing successive approximations toward the terminal response. See Successive Approximations.

Social Reinforcers——Reinforcers which result from interpersonal interaction such as attention, praise and approval, smiles, and physical contact.

Spontaneous Recovery——The temporary recurrence of a behavior during extinction. Even though the response has not been reinforced, it may suddenly reappear during the course of extinction. The magnitude of a response which temporarily recovers spontaneously is usually lower than its magnitude prior to extinction.

Stimulus——A measureable event that may have an effect upon the behavior of an individual.

Stimulus Control——The presence of a particular stimulus serves as an occasion for a particular response. A response is performed when in the presence of a particular stimulus but not in its absence. See Discriminative Stimulus.

Stimulus Generalization——Transfer of a trained response to situations or stimulus conditions other than those in which training has taken place. The behavior generalizes to other situations. Contrast with Response Generalization.

Successive Approximations——Responses which increasingly resemble the terminal behavior which is being shaped. See Shaping.

Symptom Substitution——The view stemming from the medical model that if maladaptive behavior is treated without focusing on the underlying psychological problem, a substitute symptom may develop in place of the one which was treated.

Target Behavior——The behavior to be altered or focused upon during a behavior modification program. The behavior assessed and to be changed.

Terminal Response——The final goal or behavior that is achieved at the end of shaping. See Shaping.

Time-Out from Reinforcement——A punishment procedure in which access to positive reinforcement is withdrawn for a certain period of time. The opportunity to receive reinforcement is removed contingent upon behavior. Isolation from a group exemplifies time-out from reinforcement.

Token——A tangible object which serves as a generalized conditioned reinforcer. It can be exchanged

for back-up reinforcers from which it derives its value. Poker chips, coins, tickets, stars, points, and checkmarks are commonly used as tokens. See Token Economy.

Token Economy——A reinforcement system where tokens are earned for a variety of behaviors and purchase a variety of back-up reinforcers. A token economy represents a system analogous to a national economy where money serves as a medium of exchange, and can be earned and spent in several ways.

Traits——Patterns of behavior which are enduring over time and across situations.

Transfer of Training——The extent to which responses trained in one setting transfer to settings other than those in which training takes place. See Stimulus Generalization.

Unconditioned Response——A reflex response elicited by an unconditioned stimulus. See Classical Conditioning and Respondent.

Unconditioned Stimulus——A stimulus which elicits a reflex response. The response is automatically evoked by the unconditioned stimulus. See Classical Conditioning.

Variable-Interval Schedule——A schedule of administering reinforcement. In a VI schedule, the first occurrence of the target response after a given time interval has elapsed is reinforced. However, the time interval changes each time, that is, it is variable. The schedule is denoted by the average time which must elapse before a response can be reinforced.

Variable-Ratio Schedule——A schedule of administering reinforcement. In a VR schedule, a number of occurrences of the target response is required for reinforcement. The number of responses required varies each time reinforcement is delivered. The schedule is denoted by the average number of occurrences of the response required before reinforcement is delivered.

Vicarious Reinforcement——Reinforcement of one individual sometimes increases performance of the reinforced behavior in other individuals who are not directly reinforced. A spread of reinforcement effects to other individuals who are not themselves directly reinforced.

Kazdin, A. E. Behavior Modification in applied settings. Homewood, Ill: Dorsey Press. Copyright by Dorsey Press, 1975.

TRANSFER OF TRAINING IN BEHAVIOR MODIFICATION PROGRAMS: AN EVALUATIVE REVIEW

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A selective review of behavior modification programs, which emphasized procedures for programming transfer of training and response maintenance, was undertaken. The principle focus was to evaluate the effectiveness of generalization techniques utilized with exceptional children and to enumerate several points for maintaining performance in the classroom. The role of self-management skills was also discussed, but it was concluded that logistical constraints and motivational impediments present in most special education classrooms prevent the emergence of widespread self-regulatory programming at this time. The most influential factors in programming transfer of training and response maintenance were found to be varying stimulus conditions, parent training, and peer programming.

A frequent criticism of behavior modification programs is their alleged failure to produce generalization. This usually means that what is learned in an original educational or training environment fails to occur in other similar but not previously experienced situations. This failure is especially problematic when the nature of many of the target behaviors is considered. For the most part, behavior modification programs have been used with individuals who have a history of extensive academic and social failure. Their acquisition of adaptive behaviors in special learning situations is exciting and encouraging. However, if it is true that many behavior modification programs do fail to produce generalization, there is good reason for concern. Such a failure will require that the learner receive direct training in all the new or varied settings which may be encountered. It is unlikely that sufficient staff, time, money, or other resources would be available for a large number of repeated educational or training experiences with each child.

The critical question in generalization is to identify procedures which may be used to modify an initial learning situation so that the same properties of a target behavior occur in diverse settings. Our review of 40 behavior modification articles has identified a number of issues and recommendations related to generalization procedures and principles. The first issue is whether or not generalization can occur in behavior modification programs. In reviewing the generalization effects of behavior modification programs, Kazdin (1975) concludes that while generalization seldom occurs as an automatic by-product of these programs, it can occur as a result of direct programming. He suggests several strategies for facilitating generalization:

(a) substituting naturally occurring reinforcers in place of extraneous events which may have been used to change behavior initially, (b) training relatives or other individuals in the clients' environment to carry out the contingencies, (c) gradually removing or fading the contingencies, (d) varying the conditions in which training takes place, (e) altering schedules of reinforcement, (f) increasing the delay of reinforcement, and (g) using self-control procedures. (p. 288)

Other authors have suggested similar strategies which focus on expanding the functional relationships between behavior and the environment (e.g., Drew & Espeseth, 1968). The strategies chosen for review are (a) varying stimulus conditions, (b) contingency fading, (c) use of natural reinforcers, (d) training relatives or peers, and (e) self-management. These procedures are the most common ones and have been shown to have at least some success in producing generalization.

The purpose of this review is to describe the principles and procedures involved in the above strategies, to evaluate their efficacy, and to provide a set of directions for teachers and other practitioners to use in facilitating generalization of the effects of behavior modification programs.

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Varying Stimulus Conditions

One of the more frequently used methods of programming generalization has been to vary the stimulus conditions for training. This may include introducing irrelevant or distracting stimuli, using a variety of trainers or teachers, increasing the size of the class, and conducting the training in several different settings. The purpose of these procedures is to increase the number and type of stimuli which will set the occasion for the target behavior(s). Expansion of the set of discriminative stimuli for a target behavior is necessary if a child is to learn to perform the target behaviors in a variety of settings with similar yet different stimuli.

The studies which follow demonstrate the application of behavioral learning principles to the problems involved in programming for generalized stimulus control. A first step in programming generalization is to teach the child what not to respond to in the environment, as well as what to respond to. This in effect teaches the child that there are irrelevant or distracting stimuli that are to be ignored.

The simplest approach to teaching a child to ignore irrelevant stimuli is to keep the basic relevant discriminative stimuli for the target behavior constant and to gradually introduce a number of different distracting stimuli into the training or teaching setting. By consistent reinforcement of the target behavior only when the relevant and correct stimuli are present, regardless of the presence or absence of the distracting stimuli, the child will learn to ignore the distractions and focus on the correct or relevant stimuli. An example of this procedure was reported by Gooch and Ebner (1968): Following successful development of academic behaviors in a special training room, a series of distracting stimuli was introduced. These included a television and other children. Eventually training was transferred to the classroom. The intent of these procedures was to establish and maintain control of classroom behaviors by academic stimuli (i.e., texts, worksheets, etc.).

Another aspect of the preceding study was teaching the child to perform the same behavior(s) in the presence of a number of similar though slightly different stimuli. In the above example, the child learned that there are a number of stimuli associated with a teaching situation that are supposed to set the occasion for doing academic work. These equivalent stimuli would include a teacher, desk, chair, or academic materials which are present in each setting even though the desks, chairs, books, papers, etc. may be slightly different in each setting. This procedure is an example of a special form of stimulus control instruction in which a child receives direct training with a range of "correct" stimuli for the target behavior. The basic procedure involves keeping certain aspects of the program constant while introducing the child to a variety of different examples of the same types of "correct" stimuli. This may include teaching the child to play with different peers. Generalization across peers was programmed with severely retarded children in ball-rolling and block-passing play skills (Whitman, Mercurio, & Caponigri, 1970). Different peers of the same functioning level were introduced into the play area and encouraged to play cooperatively with the two original subjects. The authors reported anecdotally that, following the generalization phase of the program, other nonprogrammed play behaviors were engaged in spontaneously with various peers.

Another training technique involves teaching the child to respond similarly to a variety of adults, such as trainers, teachers, or parents. This is critical for children whose behavior and learning problems require that a number of different individuals be able to maintain the same program across different settings. This topic is discussed in greater depth in a later section of this article.

In a series of studies with autistic children, generalization has been programmed across individuals (Koegel & Rincover, 1974; Lovaas, Koegel, Simmons, & Long, 1973; Lovaas & Simmons, 1969). In the Lovaas and Simmons study (1969), self-destructive behavior of retarded children was treated with the use of response-contingent electric shock. While it was successful in reducing self-abusive behavior, the behavior only decreased in the presence of the experimenter who delivered the shock. After several different individuals presented the electric shock to the children, generalization was rapidly attained, and self-destructive behavior was substantially reduced. Perhaps one of the most striking examples of the necessity of programmed generalization in applied settings occurred in the work reported by Lovaas, Koegel, Simmons, and Long (1973). In dealing with autistic children, these researchers found that many of the behavioral gains initially acquired during training were lost immediately in children who returned to state facilities. However, children who returned home to parents trained in similar

behavioral methods were able to maintain their new skills.

Stokes, Baer, and Jackson (1974) presented a social skills program which featurred the programmed generalization of a greeting response in four severely retarded children. Reinforcement techniques of prompting and shaping were used to establish hand-waving behavior. Training was carried out sequentially by four experimenters to develop generalization and maintenance. Tests of the greeting response with other staff members were carried out every 20 days to assess the overall generalization effects of the greeting response. Spontaneous greetings occurred in all subjects at a greater frequency after training episodes with different experimenters. Generalization to other trainers was evident in the three training environments —— playroom, courtyard, and cooridor. Further generalization was also observed in other settings, such as the dining room, city shops, and parks.

An additional problem is to teach the child that stimuli, such as instructions or forms used in job applications, may vary from time to time but that the same general types of responses are appropriate. Whitman and his associates demonstrated generalization of simple instruction-following behavior in severely retarded children (Whitman, Zakaras, & Chardos, 1971). A second set of instructions were used in conjunction with the original training set for the purpose of generalization.

In another social-skill-related program, six mildly retarded individuals were trained to fill out and complete job application forms (Clark, Boyd, & Macrae, 1975). During each session students were trained on one item of biographical information, such as a name or address. They then practiced on at least four different forms. As a posttest measure of generalization, students were given an unfamiliar job application form to fill out. They correctly completed an average of 70% more items on the posttest of generalization than they had on the pretest.

A procedure for facilitating stimulus generalization across settings is the use of a special stimulus which can be moved from one setting to another and then gradually faded. This allows for direct control of generalization that could be systematically transferred to a variety of stimuli in the settings. An example of this technique was reported with a child who had a history of falling out of a crib (Marks & Ball, 1974). These investigators trained the child to sit for extended periods of time on a small blue rug. Through systematic reinforcement, the rug took on discriminative stimulus properties for sitting and concurrently became a conditioned reinforcer. Initially, the rug was placed in the crib to control sitting rather than falling out. The rug was then placed in different areas of the child's living environment and was eventually removed as falls from the crib were completely eliminated. A 30-day follow-up revealed no increase in voluntary falling.

In summary, there are three general strategies for training stimulus generalization under varying stimulus conditions: (a) introducing irrelevant or distracting stimuli, (b) training with a range of equivalent or alternative stimuli, and (c) use of special added stimuli for transferring stimulus control which are ultimately faded out.

Contingency Fading and the Use of Natural Reinforcers

Gradual withdrawal of reinforcement contingencies is another means of facilitating response maintenance and transfer. As Kazdin (1975) notes, "Withdrawing the contingencies is a useful technique because it prepares the client for the conditions under which he must normally function. In everyday living, the contingencies often are unsystematic and the consequences for performance are delayed if present at all" (p. 221). The issue of contingency fading cannot be separated from that of substituting natural reinforcers as another method of achieving response maintenance. Naturally occurring reinforcers are those events which are normal consequences of a behavior.

There are a limited number of research reports available which demonstrate substitution of naturally occurring reinforcers as a method of promoting generalizaton and response maintenance (Hopkins, 1968; Horner, 1971; Jones & Kazdin, 1975). Hopkins (1968) taught a severely retarded child to smile contingent upon receiving candy reinforcement. Eventually the candy was withdrawn while smiling behavior was maintained through attention received from others. In another report, a moderately retarded child was taught to use crutches through a task analysis skill sequence (Horner, 1971). Use of parallel bars, prompting, and primary reinforcement was gradually faded to independent use of the crutches as the child discovered the naturally reinforcing aspects of his increased mobility, i.e., play and school.

Work done with predelinquents at Achievement Place by Phillips and his associates provides an excellent illustration of gradual removal of contingency control and the fading-in of natural reinforcement conditions (Phillips, Phillips, Fixsen, & Wolf, 1971). A highly structured token economy was established in which predelinquent boys could earn points for appropriate social behavior. Points were redeemable for extra privileges, such as going out, snacks, allowances, etc. However, in this token economy, a fading points condition was implemented. Point values were readjusted, and points were delivered on an intermittent schedule. Gradually the percentage of days in which the contingency was delivered was reduced from 100% to 8% over a 70-day period. Appropriate behaviors were maintained at a consistently high level. Eventually points were faded to the use of a merit system where all privileges were free and only social consequences supplied for the youths' behavior. Continued good behavior resulted in entrance into a homeward bound system where the youth could begin the gradual transition into his natural home.

The Achievement Place system provides a viable model for other token programs to emulate. A structured hierarchical reward system, which corresponded to naturally occurring reinforcers, was available to the youths. A major limitation of token programs is the excessive dependency many clients develop on tangible reinforcers. For a token economy to continue as an effective therapeutic program for exceptional children, natural reinforcers must gradually replace token reinforcers.

Considerable research is required to investigate optimal methods of programming the substitution of naturally occurring reinforcers into a child's environment. Fading reinforcement contingencies will not be sufficient to maintain newly developed behavior patterns unless the responses come under control of other powerful reinforcers which correspond to natural environmental conditions. Perhaps behavioral programmers must revise their approach to program development. Programs which alleviate behavior problems through externally administered reinforcement systems must be viewed as only temporary and as an intermediate step toward an ultimate program objective of either self-control or naturalistic reinforcement control.

Training Relatives and Peers in the Child's Environment

While varying the stimulus conditions during therapeutic training is one means of enhancing the likelihood of generalization, Lovaas (1967) has noted that generalization and maintenance of behaviors will occur only if parents utilize training principles in the child's day to day life. This means that parents, siblings, friends, and others who come in contact with a child who has behavior problems must be trained as behavior managers. Individuals involved with deviant children require instruction in the assessment of problem behaviors, possible contributing factors in the development of those behaviors, and finally, strategies designed to eradicate inappropriate conduct while instituting more acceptable behaviors.

Several comprehensive reviews of the literature involving the training of parents in behavior modification techniques have been published recently (Berkowitz & Graziano, 1972; O'Dell, 1974). In this section, we have reviewed only studies which demonstrate transfer of training through parental follow-through. Peer programming is also discussed as a method of influencing generalization and maintenance (Walker & Buckley, 1972).

Parent training

Moore and Bailey (1973) report a behavioral program in which a 3-year-old girl, designated as autistic, was treated through intervention by the mother. A bug-in-the-ear cueing device helped the mother apply a social reinforcement contingency for appropriate preacademic and social behavior, and social punishment for social behavior deemed inappropriate. Two major strengths of this study should be noted: (a) The mother was able to successfully utilize behavioral techniques in the home, thus continuing to exert a positive influence on the alteration of her daughter's behavior and, (b) follow-up checks at 5 and 7 months indicated maintenance of the mother's behavior in dealing with the child and sustained improvements in the child's behavior.

In another parent training study, both parents and siblings of a 5-year-old child described as autistic were taught behavioral management techniques (Wulbert, Barach, Perry, Straughan,

Sulzbacher, Turner, & Wiltz, 1974). Training took place in a mock apartment setting. Amounts of compliance behavior, language usage, and handslapping were recorded in three various settings -- school, home, and the apartment attached to the school. The authors found that neither the child's behavior nor the management techniques employed by the parents generalized from the apartment setting to the home. Instead, the behavior of the parents changed only as a function of intervention procedures being inaugurated in the home. In summary, the child effectively discriminated among stimulus conditions in the apartment and home while differentially responding to reinforcers in the two environments. What Wulbert et al. and others (DeHaven & Garcia, 1974; O'Leary, Drabman, & Kass, 1973) have demonstrated is that behaviors acquired or eliminated in a particular environment cannot be expected to generalize to environments containing differing stimulus conditions and/or reinforcement contingencies without a special program designed to produce generalization.

Perhaps the most extensive endeavor at parent training was undertaken by Kozloff (1973) who describes four efforts at training parents in initiating and maintaining social exchanges in the home. Parents of autistic children were instructed in basic behavioral management techniques designed to promote and maintain target behaviors such as speech, play, and compliance. The basic design features of the programs included the taking of baselines, various training procedures utilizing reversal formats, and a final follow-up period. Results indicated that parent training could provide an effective means to eliminate inappropriate conduct while initiating more acceptable behaviors. Though generalization to behaviors other than those directly involved in the studies was neither attempted nor assessed, the follow-up phases of the studies done several months after the conclusion of training indicated maintenance and control of the target behaviors by all parents. Training, while originally occurring in a laboratory setting, was shown to be transferable to the home by parents after a slight amount of coaching. What makes Kozloff's work significant is not that he trained parents to carry out programs, but that both the children and their parents underwent simultaneous training. Behavioral training was provided for the autistic children in the laboratory and educational settings at the same time that their parents learned how to maintain these newly acquired behaviors in the home.

Several other parent training programs have also been reported as successful in modifying the behavior of diviant children (Nordquist & Wahler, 1973; Whaler, Winkel, Peterson, & Morrison, 1965; Wahler, 1969; Zeilberger, Sampen, & Sloane, 1968). While these programs provide reasonable initial attempts at parental intervention, none of them attack the issue of the reliability of their observation techniques. It is questionable how reliability data can be gathered in the home environment by outside observers. In at least one report (Moore & Bailey, 1973), parents themselves have noted that they are not acting normally. If parents are indeed staging a performance for observers, the utility of data acquired in the home must be considered circumspect.

Peer programming

The use of peers for modifying the behavior of deviant children has been well documented (Surratt, Ulrich, & Hawkins, 1969). Yet the role of the peer as more than an agent of immediate change has received little investigation. Though peers have been used as both models for appropriate behavior and as a delivery system for contingent reinforcement, less attention in the literature has focused on the function of peers in the maintenance and generalization of appropriate behavior. One reason for this may be the difficulty and impreciseness in training peers to act in certain ways.

In a recent study with deviant children, peer programming was compared with equating stimulus conditions, teacher training, and a control group as methods to enhance generalization (Walker & Buckley, 1972). Peer programming and equating stimulus conditions were most influential in achieving generalization and maintenance of appropriate behavior. In the peer programming condition, the subject could earn points for appropriate behavior in the classroom and then exchange the points for a group reinforcement for the class, i.e., special field trips or class parties. A long-term follow-up indicated that subjects in the peer programming condition were able to maintain their success at a greater level than subjects in the other three conditions. The Walker and Buckley study represents a necessary beginning at analyzing and evaluating the efficacy of different methods of programmed generalization.

A study which highlights the efficacy of using peers and emphasizes the weaknesses that a lack of

continual programming can have is the work by Cash and Evans (1975). The authors undertook the training of three children as modifiers of their retarded siblings' behavior. The children observed films in which one child taught another child a task using a variety of six predesignated instructional methods. After viewing the films, subjects were instructed to teach these tasks to their retarded siblings. A follow-up test, without benefit of a film model, was administered 6 weeks later. The results indicated that children were effective modifiers of their siblings' behaviors after watching a modeling film. However, after the 6-week period, the proficiency with which subjects taught their brothers or sisters declined. All sessions were conducted in a laboratory setting and generalizability of the trained methodology to other types of tasks was not determined. This study points up the need for continual programming of peers to be productive and effective behavior managers.

Peer praise has also been used as a substitute for token reinforcement in an effort to fade out tokens in a classroom of four educably retarded children who displayed excessive motor behaviors (Jones & Kazdin, 1975). In this study, results are difficult to evaluate, since delay of reinforcement was also one of the mothods used to facilitate response maintenance.

Several other studies have also documented the influential effects which peers may have on the durability of behavior (O'Leary & O'Leary, 1972; Solomon & Wahler, 1973; Wahler, 1967). Although more research is required, it seems reasonable to conclude that peer programming may be an extremely viable method of promoting generalization. It may be that the unmeasured social awareness effects of knowing a peer needs a helping hand have potentially the greatest influence on durability of appropriate behavior. Future research might examine specific parameters of peer control, such as the efficacy of different CAs, populations, types of problems, and amount of adult prompting required.

Self-Management

Recent concern has questioned self-management strategies in behavioral programming. The need to be self-reliant and independent in an individual's natural environment has made the teaching of self-management skills an important tactic (Lovitt, 1973). Furthermore, the use of self-management techniques has served to reduce the time and attention required on the part of personnel to identify and consequate behavior —— at least in clinical settings (Wehman, 1975). Yet, although the need for self-managerial skills has been apparent, the component behaviors and sequencing which make up this regulatory process are unclear. This is certainly true in the educational realm.

There are several reasons for the paucity of literature dealing with self-management in the classroom. First is the definitional consideration. Mahoney (1972) has noted that the terms "self-management," "self-regulation," and "self-control" have all been accepted into the literature as a unitary construct. Experimental research, on the other hand, has dealt with the use of these appellations in a functionally different manner. For example Kazdin (1975) sees self-control as "those behaviors an individual deliberately undertakes to achieve self-selected outcomes" (p. 192). In a somewhat different vein, Thoresen and Mahoney (1974) conclude that an individual may be said to be engaging in self-control situations "when in the relative absence of immediate external constraints, he engages in behavior whose previous probability has been less than that of alternative available behaviors" (p. 12).

Logistical difficulties provide the second area of concern with self-management in the classroom. The application of positive self-reinforcement in clinical settings has proved to be one successful method of inducing self-management (Bandura, 1971; Kanfer, 1970), as have negative self-reinforcement, positive self-punishment, and negative self-punishment (Thoresen & Mahoney, 1974). However, regardless of what consequation method is used to achieve self-management, a lack of attention to salient reinforcement variables (e.g., the type of reinforcer, delay in reinforcement, or schedule of reinforcement) has often led to the demise of the acquired behavior under self-managed conditions. It is apparent that most special education classrooms are not currently equipped to determine whether an individual is reinforcing his own behavior at appropriate times. The teacher-to-student ratio often does not permit classroom personnel to continually assess how an individual child is managing his own behavior program. Initially, at least, this type of follow-up is essential to insure reward for the correct behavior.

The final difficulty involving the training of self-management skills relates to motivational

impediments. It is possible, of course, to motivate individuals by applying extrinsic reinforcement for an indeterminate length of time (Bricker, Morgan, & Grabowski, 1972). Extrinsic reinforcement may consist of material goods or information regarding the progress of the individual in his program. While the viability of extrinsic reinforcement for providing short-term motivation is apparent, it should be the goal of any behavior management program to ultimately fade out the extrinsic contingencies and turn to an internal reward system. Several studies have used extrinsic token systems in educational settings (Broden, Hall, Dunlap, & Clark, 1970; O'Leary & Becker, 1967). It does not appear, however, that any study has demonstrated control of behavior by (a) an extrinsic reinforcement system, (b) fading the extrinsic system while employing a self-management program based on an intrinsic reinforcement system, and (c) maintaining the self-managed behavior over time and across settings. Moreover, programs which are designed to change behavior without a provision for permanent maintenance are of little use and may in fact be ethically suspect.

Difficulties do not arise from the programming of self-management behaviors, but rather from getting individuals to be responsible observers of their own behavior. Furthermore, it is only with intrinsic reinforcement that training in self-management techniques can hope to be maintained over long periods of time. Generalization and maintenance of behavior under self-management conditions is a tenuous and debatable issue. Until behavior technology becomes more advanced, self-management techniques may have to be restricted to clinical settings. Only when self-managed behaviors have shown themselves to be capable of control while under internal contingencies, and maintained over time, will this procedure be suitable for educational application.

Educational Implications

Up to this point, we have reviewed studies and programs which have promoted generalization. We would now like to provide a number of practical suggestions which can influence transfer of training, and which will at the same time give the classroom teacher direction for ensuring durability of newly acquired skills in students.

Content should be selected with the consideration that it is quite likely to play a role in the student's life away from the classroom. Generalization across situations or across time can only occur if the desired behavior is reinforced across these dimensions. Therefore, once the child is removed from the original training setting and placed in his normal environment, those behaviors that were taught under training conditions must be the same ones that will be called upon in new settings. This reemphasis will eventually culminate in a further reinforcement, strengthening, and generalization of the originally taught behavior.

Classroom teachers must gradually reduce the amount of reinforcement once the student has demonstrated acquisition of the concept. Though it is unquestionably the case that a frequent reinforcement schedule produces effective and rapid strengthening of behavior, there are certain inherent difficulties with continuing this type of reward program. In the natural environment it is difficult and unnatural to provide this regular reinforcement on a continual basis. It is apparent that the natural environment does not provide reinforcement as frequently as is normally encountered under training conditions. In many instances behavior is only reinforced after a certain number of responses have been emitted or a particular interval of time has elapsed. It should also be noted that while behavior is acquired and strengthened under frequent reinforcement, it is also more easily extinguished whenever the reinforcement is removed or greatly reduced.

Therefore, we do not advocate a frequent reinforcement schedule, the only exception being the initial acquisition of a behavior. Instead, we suggest that intermittent reinforcement accomplished through a gradual fading procedure holds the greatest potential for maintenance of behavior. The use of a fading system, coupled with intermittent reinforcement, provides a system both representative of the natural environment and resistant to extinction.

Students must practice newly acquired behaviors in a number of different settings and environments. For generalization to occur from the training situation to different environments, it must be practiced and reinforced in those diverse environments. In addition, various groups of people, such as peers and parents, should be trained to deliver appropriate reinforcement across a variety of settings.

Teachers and school resource personnel must be prepared to provide transition time when changing the stimulus conditions. As stated earlier, generalization must be programmed and not expected. Since programming involves a gradual succession of therapeutic steps, time is an essential component in any management process. When the stimulus conditions of a behavior have been altered, there are bound to be some initial increases in inappropriate behavior or decreases in appropriate behavior. Change agents must be prepared for these events and must continue the program until the behavior again comes under control in a new setting. While changes in the rate of behavior are not an inevitable occurrence when altering stimulus conditions, the frequency with which they arise should alert the teacher to anticipate, and be prepared to deal with, the situation.

Classroom teachers must help the exceptional child establish his own reinforcer hierarchy. In order for reinforcers to either increase or decrease the occurrence of a behavior, they must have some value to the individual obtaining them. If a child has the opportunity to select what his own reinforcers will be, the teacher can dispense with the usual trial and error method of finding the effective contingencies of reinforcement.

In decelerating undesirable behavior, the teacher must be consistent across environments. If there is one rule that should be judiciously applied, not only for generalization measures but for all behavior management techniques, it is *consistency*. Several inadvertent reinforcements of undesirable behavior in new environments will merely extend the reinforcement schedule and make the inappropriate behavior more resistant to further eradication efforts. It is imperative that the child come to understand that his behavior, or lack of it, will be treated similarly in diverse environments.

Teachers must weigh the potential of peer control and the influence which peers can have on the durability of a behavior pattern. The possibility of peer influence as a means of facilitating response maintenance has been discussed earlier. Peer programming is an important tactic to employ in the classroom, since other students have both the time, the opportunity, and an extraordinary amount of reinforcement value. However, while peer control is feasible, there are certain concerns that each teacher must weigh in determining if this technique can be useful in the classroom. Specifically, the verbal level of the class may not be conducive to peer programming; many students' parents may not be favorable to their child being used as a change agent to help another student; and the consistency and follow through of peers in the program may not be adequate. If an affirmative response to each of these conditions cannot be made, peer programming may not be the best means of achieving maintenance and generalization.

When employing token economy programs for classroom control or for developing new behaviors, the teacher should plan to fade the token reinforcement and help students develop self-administered reinforcement systems. Model programs, such as Achievement Place, should be closely examined by teachers contemplating the use of token economy programs. The student should have increasing amounts of input in selecting reinforcers, establishing criteria, and determining the availability of earning reinforcement for himself. With a dynamic changing economy, the reinforcer system does not lose its potency and student interest remains keen. In this manner, tokens as well as their back-up reinforcers will retain their reinforcing properties in different settings.

Instructions given by teachers or peers should be explicit and at least initially followed by immediate behavioral consequences. Teachers or peer direction must be clear and concise. In the event that several teachers or a teacher and peers are giving instructions to a child, coordination among those giving direction must be arranged so that consistency is maintained and confusion avoided. Even for the individual teacher, it is important to give instructions that are clear, can be understood by the child, and are consistent across settings and time.

It is of equal importance when attempting to get a behavior to generalize to follow that behavior by immediate consequation. Behavior and reinforcement must be paired so that a functional relationship begins to accrue between these components.

Conclusion

Several issues have been considered by this review. The first of these points revolves around the often quoted and seldom heeded remark by Baer, Wolf and Risley (1968) that "generalization should be programmed, rather than expected or lamented" (p. 97). Too often, educators and clinicians alike

have assumed that behaviors acquired in one setting have inherent generalization properties built in as a function of training. Much to the chagrin of all behavior managers and contrary to this frequently held belief, generalization requires the same attention to detailed planning as any intervention program.

Secondly, a review of the literature revolving around the five most common strategies employed to program transfer of training was undertaken. These included the following: (a) varying stimulus conditions, (b) contingency fading, (c) the use of natural reinforcers, (d) training relatives or peers, and (e) self-management. With the exception of self-management training, all of these procedures have proven to be viable techniques to use with exceptional children for the maintenance and generalization of behavior in the classroom. Each technique has its advantages and disadvantages to the teacher in terms of appropriateness, time consumption, or ease of administration. Therefore, teachers must individually determine which technique is most efficacious and responsive to both their needs and the needs of the child in a given situation.

Finally, more research is needed which examines the comparative efficacy of these different approaches in promoting transfer and response maintenance. Empirical data comparing two or more of these techniques and indicating the strengths and weaknesses of one procedure over another is sorely needed.

References

Baer, D. M., Wolf, M. M., & Risley, T. R. Some current dimensions of applied behavior analysis. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1968, 1, 91-97.

Bandura, A. Vicarious and self-reinforcement processes. In R. Glaser (Ed.), THE NATURE OF REINFORCEMENT. New York: Academic Press, 1971.

Berkowitz, A., & Graziano, A. Training parents as behavior therapists: A review. BEHAVIOR RESEARCH AND THERAPY, 1972, 10, 297-317.

Bricker, W. A., Morgan, D. G., & Grabowski, J. G. Development and maintenance of a behavior modification repertoire of cottage attendants through T.V. feedback. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1972, 77, 128-136.

Broden, M., Hall, R. V., Dunlap, A., & Clark, R. Effects of teacher attention and a token reinforcement system in a junior high school special education class. EXCEPTIONAL CHILDREN, 1970, 36, 341-349.

Cash, W. M., & Evans, I. M. Training pre-school children to modify their retarded siblings' behavior. JOURNAL OF BEHAVIOR THERAPY AND EXPERIMENTAL PSYCHIATRY, 1975, 6, 13-16.

Clark, H., Boyd, S., & Macrae, J. A classroom program teaching disadvantaged youths to write biographic information. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1975, 8, 67-76.

DeHaven, E. D., & Garcia, E. E. Continuation of training as a variable influencing the generalization of speech in a retarded child. JOURNAL OF ABNORMAL CHILD PSYCHOLOGY, 1974, 2, 217-227.

Drew, C., & Espeseth, V. Transfer of training with the mentally retarded: A review. EXCEPTIONAL CHILDREN, 1968, 34, 129-132.

Gooch, B., & Ebner, M. A BEHAVIOR MODIFICATION APPROACH UTILIZING SEQUENTIAL RESPONSE TARGETS IN MULTIPLE SETTINGS. Paper presented at meeting of Midwestern Psychological Association, Chicago, May 1968.

Hopkins, B. L. Effects of candy and social reinforcement, instructions, and reinforcement schedule learning on the modification and maintenance of smiling. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1968, 1, 121-129.

Horner, R. Establishing use of crutches by a mentally retarded spina bifida child. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1971, 4, 183-190.

Jones, R., & Kazdin, A. Programming response maintenance after withdrawing token reinforcement. BEHAVIOR THERAPY, in press.

Kanfer, F. H. Self-regulation: Research issues and speculations. In C. Neuringer & J. L. Michael (Eds.), BEHAVIOR MODIFICATION IN CLINICAL PSYCHOLOGY. New York: Appleton-Century-Crofts, 1970.

Kazdin, A. BEHAVIOR MODIFICATION IN APPLIED SETTINGS. Homewood, Ill.: The Dorsey Press, 1975.

Koegel, R. L., & Rincover, A. Treatment of psychotic children in a classroom environment: I. Learning in a large group. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1974, 7, 45-59.

Kozloff, M. A. REACHING THE AUTISTIC CHILD: A PARENT TRAINING PROGRAM. Champaign: Research Press, 1973.

Lovaas, O. I. A behavior therapy approach to the treatment of childhood schizophrenia. In MINNESOTA SYMPOSIUM ON CHILD PSYCHOLOGY. University of Minnesota Press, 1967.

Lovaas, O. I., & Simmons, J. Manipulation of self-destruction in three retarded children. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1969, 2, 143-157.

Lovaas, O. I., Koegel, R., Simmons, J., & Long, J. Some generalization and follow-up measures on autistic children in behavior therapy. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1973, 6, 131-166.

Lovitt, T. C. Self-management projects with children with behavioral disabilities. JOURNAL OF LEARNING DISABILITIES, 1973, 6, 15-28.

Mahoney, M. J. Research issues in self-management. BEHAVIOR THERAPY, 1972, 3, 45-63.

Marks, P., & Ball, T. Hazardous voluntary falling: A treatment approach. MENTAL RETARDATION 1974, 12, 36-39.

Moore, B., & Bailey, J. Social punishment in the modification of a preschool child's "autistic-like" behavior with a mother as therapist. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1973, 6, 497-508.

Nordquist, M., & Wahler, R. Naturalistic treatment of an autistic child. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1973, 6, 79-88.

O'Dell, S. Training parents in behavior modification: A review. Psychological Bulletin, 1974, 81, 418-433.

O'Leary, K. D., & Becker, W. C. Behavior modification of an adjustment class: A token reinforcement program. EXCEPTIONAL CHILDREN, 1967, 33, 637-642.

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O'Leary, K. D., Drabman, R. S., & Kass, R. E. Maintenance of appropriate behavior in a token program. JOURNAL OF ABNORMAL CHILD PSYCHOLOGY, 1973, 1, 127-138.

O'Leary, K. D., & O'Leary, S. CLASSROOM MANAGEMENT: THE SUCCESSFUL USE OF BEHAVIOR MODIFICATION. New York: Pergamon Press, 1972.

Phillips, E. L., Phillips, E. A., Fixsen, D., & Wolf, M. M. Achievement place: Modification of the behaviors of predelinquent boys within a token economy. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1971, 4, 45-59.

Solomon, R., & Wahler, R. Peer reinforcement control of classroom problem behavior. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1973, 6, 49-56.

Stokes, T., Baer, D., & Jackson, R. Programming the generalization of a greeting response in four retarded children. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1974, 7, 599-610.

Surratt, P., Ulrich, R., & Hawkins, R. An elementary student as a behavioral engineer. JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1969, 2, 85-92.

Thoresen, C., & Mahoney, M. BEHAVIORAL SELF-CONTROL. New York: Holt, Rinehart and Winston, 1974.

Wahler, R. Child-child interactions in free field settings: Some experimental analyses. JOURNAL OF EXPERIMENTAL CHILD PSYCHOLOGY, 1967, 5, 278-293.

Wahler, R. Setting generality: Some specific and general effects of child behavior therapy. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1969, 2, 239-246.

Wahler, R., Winkel, G., Peterson, R., & Morrison, D. Mothers as behavior therapists for their own children. BEHAVIOR RESEARCH AND THERAPY, 1965, 3, 113-124.

Walker, H. M., & Buckley, N. K. Programming generalization and maintenance of treatment effects across time and settings. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1972, 5, 209-224.

Wehman, P. Behavioral self-control with the mentally retarded. JOURNAL OF APPLIED REHABILITATION COUNSELING, 1975, 6, 27-34.

Whitman, T., Mercurio, J., & Caponigri, V. Development of social responses in two severely retarded children. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1970, 3, 133-138.

Whitman, T., Zakaras, M., & Chardos, S. Effects of reinforcement and guidance procedures on instruction-following behavior of severely retarded children. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1971, 4, 283-290.

Wulburt, M., Barach, R., Perry, M., Straughan, J., Sulzbacher, S., Turner, K., & Wiltz, N. The generalization of newly acquired behaviors by parents and child across three different settings — A study of an autistic child. JOURNAL OF ABNORMAL CHILD PSYCHOLOGY, 1974, 2, 87-98.

Zeilberger, J., Sampen, S. E., & Sloane, H. N. Modification of a child's problem behaviors in the home with the mother as therapist. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1968, 1, 47-53.

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Pretest with Key

PRETEST

1. Dr. A. has designed a token economy which includes a provision for removing previously earned tokens contingent upon certain inappropriate behaviors. This technique is called____.

2. ____ is the reinforcement of successively closer approximations of the target behavior.

3. ____ is the name for the occurrence of a response following a stimuli similar but not the same as the training stimulus.

4. When Jimmy cries in the store to increase his mother's candy-buying behavior, crying is a____ for his mother.

5. I am trying to teach John to tell red from orange by reinforcing responses to a very bright red light as I gradually increase the brightness of a very dim orange light. I want to make the steps small enough so he will never choose orange. I am using____.

6. When a behaviorist ignores a behavior in order to remove previous sources of reinforcement, the procedure is known as____.

7. Ann's voice is much louder than normal conversational standards. I want to decrease the ____ of her speaking behavior.

8. I am training Johnny to eat with a spoon by holding my hand around his hand as he uses the spoon. To make this behavior independent I intend to gradually decrease the amount of pressure I use. This is called____.

9. When we alter the probability of a behavior's frequency by altering the consequences of the behavior, we are using____.

10. When a behavior isn't occurring independently, a trainer will often use ____ as the discrimination stimulus.

11. A spanking is not _____in the behavioral sense unless it is delivered contingently and has the effect of decreasing the future likelihood of the behavior it followed.

12. The behavior I wish the student to emit at the successful conclusion of training is called the ____.

13. To a behaviorist, the items for which money can be exchanged are____.

14. Which of the following is a statement of the Premack Principle?
    A. A high preference activity followed by a low preference activity will be reinforced.
    B. A low preference activity followed by a high preference activity will be reinforced.
    C. A high preference activity followed by a high preference activity will be reinforced.
    D. A low preference activity followed by the removal of another low preference activity will be reinforced.
    E. A high preference activity followed by the removal of another high preference activity will be reinforced.

15. A good example of stimulus generalization would be:
    A. when other responses begin to decrease at the same time the target behavior is reinforced.
    B. when similar stimuli or events in the environment play a less significant role in responding.
    C. when other responses begin to increase at the same time the target behavior is being reinforced.

D. when transfer of training occurs across similar stimuli or events in the environment.
E. none of the above.

16. Mr. Burger has decided that too many dishes are being broken by the waiters. He is now going to institute a new procedure whereby the waiter must pay for each broken dish. This procedure is an example of:
A. response cost.
B. time-out.
C. negative reinforcement.
D. discrimination training.
E. overcorrection.

17. After Mike has learned to come to his seat on time, the teacher:
A. should continue to reinforce Mike each time he is on time.
B. should reinforce Mike on an intermittent schedule.
C. should omit reinforcement so that Mike's behavior will not become dependent upon it.
D. should continue to observe Mike to determine if any symptom substitution has occurred.
E. put Mike on a FR:1 reinforcement schedule.

18. Mr. Trent notices that the candy which has been acting as a very successful reinforcer for several weeks, is no longer maintaining the desirable behavior he had gotten before. What should he do?
A. Increase the amount of candy he gives each time.
B. Decrease the requirement for receiving a piece of candy.
C. Change to another reinforcer.
D. Record another baseline.
E. Begin a method of shaping correct behavior.

19. When attempting to develop a new behavior, the behavior approximation should initially:
A. be reinforced frequently and immediately.
B. not be reinforced too often so the child becomes dependent on reinforcement.
C. not be reinforced until the behavior is perfect so the child will learn what is correct.
D. be reinforced on an intermittent schedule.
E. all of the above.

20. Which one of the following could account for the development of a new behavior?
A. imitation.
B. observational learning.
C. modeling.
D. all of the above.
E. none of the above.

True or False:

21. T F An example of a prompt is the teacher saying "Take out your books and turn to page 16."

22. T F Prompts may be faded out when teaching a new behavior.

23. T F During a supper meal, Dawn accidentally bumped Tony who responded by calling her a very nasty name. Tony's father immediately took Tony into his bedroom and severely spanked him for his swearing. One can be assured, that Tony will never exhibit swearing behavior again.

24. T F You can generally tell whether your extinction procedure is effective in reducing undesirable behavior immediately after initiating the extinction procedure.

Pretest Key

1. Response Cost
2. Shaping
3. Generalization
4. Negative Reinforcer
5. Errorless Discrimination
6. Extinction
7. Intensity
8. Fading
9. Operant Conditioning
10. A Prompt
11. Punishment
12. Target Behavior
13. Back-Up Reinforcer
14. B
15. D
16. A
17. B
18. C
19. A
20. D
21. T
22. T
23. F
24. F

Post-test with Key

POST-TEST

1. If I reduce Maureen's pacing by praising her for sitting still, I am reinforcing a(n)_____.

2. Verbal expressions of approval which increase the frequency of behaviors are_____.

3. An M&M is a _____ because it can be physically seen and felt.

4. If I trained a behavior six months ago and now return to see if that behavior is still occurring, I am checking for_____.

5. If Behavior A is contingently followed by Consequence C and the frequency of A increases, C can be called a_____.

5. If I allow myself to watch my favorite TV program only after reading three chapters in my dullest textbook, I am making use of_____.

7. When you ____students, you remove them from the reinforcing environment for a brief period of time.

8. A factory whistle is a _____to begin work.

9. I want to increase the length of time my dog Mutt will stay on command, that is, I wish to alter the _____ of his behavior.

10. Marilyn is a severely retarded child who lives in an institution. She displays many "stereotyping" behaviors such as rocking back and forth and looking blankly at her hands. Recently the staff psychologist has been using a treatment procedure in which he has Marilyn hold her hands and body in more socially appropriate positions for 15 minutes contingent upon the stereotyping behavior. This has resulted in a decrease of the stereotyping behavior. This is an example of:
    A. response cost.
    B. negative reinforcement.
    C. overcorrection.
    D. massed practice.
    E. none of the above.

11. A stimulus which signals both the time and the place at which a behavior will produce a reinforcing event is:
    A. a neutral stimulus.
    B. a discriminative stimulus.
    C. an eliciting stimulus.
    D. a reinforcing stimulus.

12. A moderately retarded girl must learn to put plastic sleeves on eight wood screws and then place these screws in a plastic bag. She will use a wooden tray with eight black spots to aid in counting. The tray has a handle and a spout over which she is to place the bag and pour in the assembled crews. She must first tilt the tray forward holding the bag over the spout with one hand, while manipulating the handle with the other. If you were the supervisor which of the following would be the optimal training method?
    A. forward chaining.
    B. modeling.
    C. backward chaining.
    D. prompting and fading.
    E. modeling and backward chaining.

13. If we want John to sit with his back straight in a chair, we first reinforce any sitting that is straighter than he presently sits, slowly increasing the requirement to obtain the terminal objective. This procedure is called:
    A. shaping.
    B. fading.
    C. functional analysis.
    D. response cost.
    E. none of the above.

14. To provide the optimum learning environment for each child, the teacher should:
    A. provide a range of reinforcing events.
    B. satiate the child with the chosen reinforcer.
    C. apply the reinforcing events contingent upon behavior.
    D. be consistent with whatever program s/he has chosen.
    E. all but B.

15. Which of the following pairs of terms are the most opposite in terms of behavioral function?
    A. modeling - chaining.
    B. overcorrection - response cost.
    C. reinforcement menu - Premack.
    D. generalization - discrimination.
    E. punishment - extinction.

16. The strength or probability of behavior can be increased by the use of:
    A. positive reinforcement.
    B. negative reinforcement.
    C. Premack principle.
    D. all of the above.
    E. none of the above.

17. Ms. Jones has been using a popular RE menu for several months but Tim appears to be reverting to his old uncooperative behavior lately. What would be a likely reason for this?
    A. Tim is tired of cooperating.
    B. Tim is satiated with the RE menu items.
    C. Tim is basically never going to change.
    D. The tangible reinforcers on the list are too abstract.
    E. Ms. Jones has not withheld or delayed the presentation of the reinforcers for a long enough period of time.

18. Maurice disrupts his 5th grade classroom with loud yawns more than several times a day. Ms. Brown, his teacher, vocally reprimands him after each yawn. Over the course of a week, Maurice seems to be getting "sleepier" judging by the increased frequency of his yawns. Now, here is a typical example of Ms. Brown's reprimands operating as:
    A. classical conditioning.
    B. punishments.
    C. positive reinforcers.
    D. neutral stimuli.
    E. none of the above.

19. Thelma Lou scratches herself continuously. Her mother has become very concerned and wishes to devise a program to eliminate the scratching behavior. If the mother wishes to use DRO procedures, she would:
    A. reinforce all behavior that is not scratching behavior.
    B. punish each scratching behavior.
    C. institute a form of response cost whereby Thelma Lou would lose a specific reinforcer.
    D. negatively reinforce the scratching behavior.
    E. none of the above would be included in this procedure.

True or False

20. T F Every step in a forward chaining procedure receives reinforcement at some time during the procedure.

21. T F Punishment can involve either the presentation of an aversive stimulus or the removal of a positive stimulus.

22. T F There are three procedures of punishment: PAS (presentation of an aversive stimulus), Time-out, and Response-cost.

23. T F Response generalization and stimulus generalization are both similar in that they both involve a transfer of training across situations.

24. T F Behavior modification programs designed only to eliminate behavior are apt to result in the display of other unadaptive behaviors.

25. T F In backward chaining, the first response that is taught in the procedure is the one that is always reinforced through the procedure.

26. T F If reinforcement is delayed, your program may not work because the child no longer will know what is being reinforced.

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Post-Test Key

1. Incompatible Behavior
2. Social Reinforcers
3. Tangible Reinforcer
4. Maintenance
5. Positive Reinforcer
6. Premack Principle
7. Time-Out
8. Cue (Discriminative Stimulus)
9. Duration
10. C
11. B
12. E
13. A
14. E
15. D
16. D
17. B
18. C
19. A
20. T
21. T
22. T
23. F
24. T
25. T
26. T

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Bibliography

Albin, J. The treatment of pica (scavenging) behavior in the retarded: a critical analysis and implications for research. MENTAL RETARDATION, 1977, Vol. 15, No. 4, pp. 14-18.

Azrin, H. W., Wesolowski, M. Eliminating habitual vomiting in a retarded adult by positive practice and self-correction. JOURNAL OF BEHAVIOR THERAPY AND EXPERIMENTAL PSYCHIATRY, 1975, Vol. 6, No. 2, pp. 145-146.

Azrin, N. H., Kaplan, S. J., Foxx, R. M. Autism reversal: Eliminating stereotyped self-stimulation of retarded individuals. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1973, Vol. 78, pp. 241-248.

Azrin, N., Gottlieb, L., Hughart, H., Wesolowski, M., Rahn, T. Eliminating self-injurious behavior by educative procedures. BEHAVIOR RESEARCH AND THERAPY, 1975, Vol. 13, pp. 101-111.

Azrin, N. H., Armstrong, P. M. The "mini-meal"——a method for teaching eating skills to the profoundly retarded. MENTAL RETARDATION, 1973, Vol. 11, No. 1, pp. 9-13.

Azrin, N. H., Foxx, R. M. A rapid method of toilet training the institutionalized retarded. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1971, Vol. 4, pp. 89-99.

Azrin, N. H., Foxx, R. M. TOILET TRAINING IN LESS THAN A DAY. New York: Simon and Schuster, 1974.

Azrin, N., Powers, M. Eliminating classroom disturbances of emotionally disturbed children by positive practice. BEHAVIOR THERAPY, 1975, Vol. 6, pp. 525-534.

Azrin, N., Wesolowski, M. The use of positive practice to eliminate persistent floor sprawling by profoundly retarded persons. BEHAVIOR THERAPY, 1975, Vol. 6, pp. 627-631.

Azrin, N. H., Nunn, R. G. Habit reversal: a method of eliminating nervous habits and tics. BEHAVIORAL RESEARCH AND THERAPY, 1973, Vol. 11, pp. 619-628.

Azrin, N. H., Sneed, T. J. Foxx, R. M. Dry bed: a rapid method of eliminating bedwetting (enuresis) of the retarded. BEHAVIOR RESEARCH AND THERAPY, 1973, Vol. 11, pp. 427-434.

Bailey, J., Meyerson, L. Vibration as a reinforcer with a profoundly retarded child. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1969, Vol. 2, pp. 135-137.

Baker, B., Ward, M. Reinforcement therapy for behavior problems in severely retarded children. AMERICAN JOURNAL OF ORTHOPSYCHIATRY, 1971, Vol. 4, p. 124.

Baker, J. G., Stanish, B., Fraser, B. Comparative effects of a token economy in nursery school. MENTAL RETARDATION, 1972, Vol. 10, pp. 16-20.

Barton, E. S., Guess, P. D., Garcia, E., Baer, D. M. Improvement of retardate's mealtime behaviors by timeout procedures using multiple baseline techniques. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1970, Vol. 3, pp. 77-84.

Barton, E. S. Inappropriate speech in a severely retarded child: A case study in language conditioning and generalization. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1970, Vol. 3, pp. 299-309.

Bates, P., Wehman, P. Behavior management with the mentally retarded; an empirical analysis of the research. MENTAL RETARDATION, 1977, Vol. 15, in press.

Birnbrauer, J. S. Generalization of punishment effects - a case study. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1968, Vol. 1, pp. 201-211.

Bostow, D. E., Bailey, J. B. Modification of severe disruptive and aggressive behavior using brief timeout and reinforcement procedures. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1969, Vol. 2, pp. 31-38.

Bucher, B., Reykdal, B., Albin, J. Brief physical restraint to control pica in retarded children. JOURNAL OF BEHAVIOR THERAPY AND EXPERIMENTAL PSYCHIATRY, 1976, Vol. 2, pp. 137-140.

Bucher, B., King, L. W. Generalization of punishment effects in the deviant behavior of a psychotic child. BEHAVIOR THERAPY, 1971, Vol. 2, pp. 68-77.

Calhoun, K. The effects of varying schedules of time-out aggressive behavior of a retarded girl. JOURNAL OF BEHAVIOR THERAPY AND EXPERIMENTAL PSYCHIATRY, 1975, Vol. 6, No. 2, pp. 139-144.

Clark, H. B., Rowbury, T., Baer, A. M., Baer, D. M. Timeout as a punishing stimulus in continuous and intermittent schedules. JOURNAL OF APPLIED ANALYSIS, 1972, Vol. 6, pp. 443-455.

Corte, H. E., Wolf, M. M., Locke, B. J. A comparison of procedures for eliminating self-injurious behavior of retarded adolescents. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1971, Vol. 4, pp. 201-213.

Dietz, S. M., Repp, A. C. Decreasing classroom misbehavior through the use of DRL schedules of reinforcement. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1973, pp. 457-463.

Doubros, S. G., Daniels, G. J. An experimental approach to the reduction of overactive behavior. BEHAVIOR RESEARCH AND THERAPY, 1966, Vol. 4, pp. 251-258.

Edwards, M. Lilly, R. T. Operant conditioning: An application to behavioral problems in groups. MENTAL RETARDATION, 1966, Vol. 4, pp. 18-21.

Favell, J. E. Reduction of stereotypes of reinforcement of toy play. MENTAL RETARDATION, 1973, Vol. 11, pp. 21-23.

Foxx, R. M. The use of overcorrection to eliminate the public disrobing of retarded women. BEHAVIOR RESEARCH AND THERAPY, 1975, Vol. 13, pp. 1-9.

Foxx, R. M., Azrin, N. H. Restitution: A method of eliminating aggressive-disruptive behavior of retarded and brain-damaged patients. BEHAVIOR RESEARCH AND THERAPY, 1972, Vol. 10, pp. 15-27.

Foxx, R. M., Martin, E. Treatment of scavenging behavior by overcorrection. BEHAVIOR RESEARCH AND THERAPY, 1975, Vol. 13, pp. 153-160.

Foxx, R. M., Azrin, N. H. Dry pants: a rapid method of toilet training children. BEHAVIOR RESEARCH AND THERAPY, 1973, Vol. 11, pp. 435-442.

Foxx, R. M., Azrin, N. H. The elimination of autistic self-stimulatory behavior by overcorrection. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1973, Vol. 6, pp. 1-14.

Foxx, R. M., Azrin, N. H. TOILET TRAINING THE RETARDED. Champaign, Ill.: Research Press, 1973.

Giast, D., Nelson, C. M. Time-out in the classroom: implications for special education. EXCEPTIONAL CHILDREN, 1977, Vol. 43, No. 7, pp. 461-463.

Greene, R. J., Hoats, D. L. Aversive tickling: A simple conditioning technique. BEHAVIOR THERAPY, 1971, Vol. 2 pp. 389-393.

Griffin, J., Locke, B. & Landers, W. Manipulation of potential punishment parameters in the treatment of self-injury. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1975, Vol. 4, p. 458.

Hamilton, J., Standahl, J. Suppression of stereotyped screaming behavior in a profoundly retarded institutionalized female. JOURNAL OF EXPERIMENTAL CHILD PSYCHOLOGY, 1969, Vol. 7, pp. 114-121.

Hamilton, J., Stephens, L., Allen, P. Controlling aggressive and destructive behavior in severely retarded institutionalized residents. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1967, Vol. 71, pp. 852-856.

Henriksen, K., Doughty, R. Decelerating undesirable mealtime behavior in a group of profoundly retarded boys. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1967, Vol. 72, pp. 40-45.

Jackson, A., Et. al. Food satiation as a procedure to decelerate vomiting. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1975, Vol. 80, No. 2, pp. 223-227.

Kohlenberg, R. J. The punishment of persistent vomiting: A case study. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1970, Vol. 3, pp. 241-245.

Lovaas, O. I., Fretag, G., Gold, V. M., Kassorla, I. C. Experimental studies in childhood schizophrenia: Analysis of self-destructive behavior. JOURNAL OF EXPERIMENTAL CHILD PSYCHOLOGY, 1965, Vol. 2, pp. 67-84.

Lovaas, O. I., Simmons, J. Q. Manipulation of self-destruction in three retarded children. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1969, Vol. 2, pp. 143-157.

Lutaker, J. R. Social reinforcement control of exhibitionism in a profoundly retarded adult. MENTAL RETARDATION, 1974, Vol. 12, pp. 46-47.

MacMillan, D. L., Forness, S. R., Trumbull, B. M. The role of punishment in the classroom. EXCEPTIONAL CHILDREN, 1973, Vol. 40, pp. 85-96.

Martin, G. L., England, G., Kaprowey, E., Kelgour, K., Pilek, V. Operant conditioning of kindergarten class behavior in autistic children. BEHAVIOR RESEARCH AND THERAPY, 1968, Vol. 6, pp. 281-294.

Merbaum, M. The modification of self-destructive behavior by a mother-therapist using aversive stimulation. BEHAVIOR THERAPY, 1973, Vol. 4, pp. 442-447.

Mithaug, D., Hanawalt, D. Employing negative reinforcement to establish and transfer control of a severely retarded and aggressive nineteen year old girl. AAESPH REVIEW, 1977, Vol. 2, No. 1, pp. 37-49.

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Measel, C., Alfrieri, P. Treatment of self-injurious behavior by a combination of reinforcement for incompatible behavior and overcorrection. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1976, Vol. 81, No. 2, pp. 147-153.

Mulhern, T., Baumeister, A. An experimental attempt to reduce stereotype by reinforcement procedures. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1969, Vol. 74, pp. 69-75.

Musick, J. L., Luckey, R. E. Program profiles: A token economy for moderately and severely retarded. MENTAL RETARDATION, 1970, Vol. 8, pp. 15-19.

O'Brien, F., Azrin, N. H. Developing proper mealtime behaviors of the institutionalized retarded. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1972, Vol. 5, pp. 389-399.

O'Brien, F., Bugle, C., Azrin, N. H. Training and maintaining a retarded child's proper eating. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1972, Vol. 5, pp. 67-72.

Paul, H. A., & Miller, J. R. Reduction of extreme deviant behaviors in a severely retarded girl. THE TRAINING SCHOOL BULLETIN, 1971, Vol. 67, pp. 193-198.

Pendergrass, V. E. Timeout for positive reinforcement following persistent, high rate behavior in retardates. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1972, Vol. 5, pp. 85-91.

Peterson, R. F., Peterson, L. R. The use of positive reinforcement in the control of self-destructive behavior in a retarded boy. JOURNAL OF EXPERIMENTAL CHILD PSYCHOLOGY, 1968, Vol. 6, pp. 351-360.

Perline, I. H., Levinsky, D. Controlling maladaptive classroom behavior in the severely retarded. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1968, Vol. 73, pp. 74-78.

Piper, T. J., MacKinnon, R. C. Operant conditioning of a profoundly retarded individual reinforced via a stomach fistula. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1969, Vol. 73, pp. 627-630.

Ragain, R. Anson, J. The control of self-mutilating behavior with positive reinforcement. MENTAL RETARDATION, 1976, Vol. 14, No. 3, pp. 22-24.

Repp. A., Dietz, S., Dietz, D. Reducing inappropriate behaviors in classrooms. MENTAL RETARDATION, 1976, Vol. 14, No. 1, pp. 11-14.

Risley, T. R. The effects and side effects of punishing the autistic behaviors of a deviant child. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1968, Vol. 1, pp. 21-34.

Rusch, F., Close, D. Overcorrection: a procedural evaluation. AAESPH REVIEW, 1976, Vol. 1, No. 5, pp. 32-45.

Sailor, W., Guess, P. D., Rutherford, G., Baer, D. M. Control of tantrum behavior by operant techniques during experimental verbal training. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1968, Vol. 1, pp. 237-243.

Smoley, S. R. Use of operant techniques for the modification of self-injurious behavior. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1971, Vol. 76, pp. 295-305.

Tate, B. G. A case study: Control of chronic self-injurious behavior by conditioning procedures. BEHAVIOR THERAPY, 1972, Vol. 3, pp. 72-83.

Tate, B. G., Baroff, G. S. Aversive control of self-injurious behavior in a psychotic boy. BEHAVIOR RESEARCH AND THERAPY, 1966, Vol. 4, pp. 281-287.

Twardoz, S., Sajwaj, T. Multiple effects of a procedure to increase sitting in a hyperactive retarded. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1972, Vol. 5, pp. 73-78.

Vukelich, R., Hake, D. F. Reduction of dangerously aggressive behavior in a severely retarded resident through a combination of positive reinforcement procedures. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1971, Vol. 4, pp. 215-225.

Webster, D. R. Azrin, N. H. Required relaxation: a method of inhibiting agitative-disruptive behavior of retardates. BEHAVIOR RESEARCH AND THERAPY, 1973, Vol. 11, pp. 67-78.

Wehman, P., Schutz, R., Renzaglia, A. and Karan, O. The use of positive practice training in work adjustment with two profoundly retarded adolescents. VOCATIONAL EVALUATION AND WORK ADJUSTMENT, 1977, Vol. 10, No. 2.

Weisberg, P., Passman, R. H., Russell, J. E. Development of verbal control over bizarre gestures of retardates through imitative and nonimitative reinforcement procedures. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1973, Vol. 6, pp. 487-495.

Weisen, A. E., & Watson, E. Elimination of attention seeking behavior in a retarded child. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1967, Vol. 72, pp. 50-52.

White, G. D., Nielsen, G., Johnson, S. M. Timeout duration and the suppression of deviant behavior in children. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1972, Vol. 5, pp. 111-120.

White, J. C., Taylor, D. C. Noxious conditioning as a treatment for rumination. MENTAL RETARDATION, 1967, Vol. 5, pp. 30-34.

Whitman, T. L., Caponign, V., Mercurio, J. Reducing hyperactive behavior in a severely retarded child. MENTAL RETARDATION, 1971, Vol. 9, pp. 17-20.

Whitman, T. L., Zakaras, M., Chardos, S. Effects of reinforcement and guidance procedures on instruction following behavior of severely retarded children. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1971, Vol. 4, pp. 283-291.

Wolf, M. M., Birnbrauer, J. S., Williams, T., Lawler, J. A note on apparent extinction of the vomiting behavior of a retarded child. In L. P. Ullmann and L. Krasner (Eds.), CASE STUDIES IN BEHAVIOR MODIFICATION, New York: Holt, Rinehart & Winston, 1965, pp. 364-366.

Wolf, M. M. Risely, T., Mees, H. Application of operant conditioning procedures to the behavior problems of an autistic child. BEHAVIOR RESEARCH AND THERAPY, 1964, Vol. 1, pp. 205-312.

Wrighton, P. A., Martin, G. L., Lumsden, J. VARIABLE RATIO PUNISHMENT WITH A MILD PUNISHER TO DECREASE PERSISTENT UNDESIRABLE BEHAVIOR DURING POSTURE TRAINING WITH PROFOUNDLY RETARDED ADULT FEMALES. Unpublished manuscript, Department of Psychology, St. Paul's Coblege University of Manitoba, Winnipeg 19, Canada.

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Media Services
Experimental Education Unit
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Physical Management

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Overview

Proper physical management can help an individual maintain present abilities and acquire new skills as well as prevent further disability and certain complications. Before attempting any "educational" programming it is necessary and crucial to position yourself (the teacher) and the student properly for optimal functioning. It will be easier to care for the student in all respects if he/she is properly positioned and managed. It will be safer for the teacher, other personnel and the student if proper training in physical management is stressed and carried out.

A few benefits of proper physical management and positioning are: facilitation in providing general health care needs; prevention of painful complications independent of the primary handicapping condition; provision of opportunities to become independent in daily living activities such as feeding, dressing, toileting; enhancement of motor development and development in other areas such as speech, language, socialization, academics; provision of good body alignment so as to prevent medical complications such as scoliosis, contractures, dislocation of hips, aspiration of foods and liquids; less distortion of visual and labyrinthine concepts; enhancement of student's awareness of his/her environment.

Objectives

General Objectives

Section I: What is Cerebral Palsy?

1. The participant will understand what cerebral palsy is.
2. The participant will understand the classification system used for C.P.
3. The participant will understand normal movement patterns and how these are disturbed or changed in C.P.
4. The participant will understand what factors should be evaluated when planning a program for an individual with C.P.

Section II: Transfers, Positioning, Management of Equipment.

1. The participant will become aware of the basics of good positioning.
2. The participant will be able to make recommendations to improve an individual's general positioning for classroom activity.
3. The participant will learn how to use proper body mechanics and will carry out three basic transfers appropriately.
4. The participant will learn basic care and maintenance of wheelchairs and adaptive equipment.
5. The participant will learn safety techniques concerning wheelchairs and management of individuals with ambulation problems.

Section III: Training Techniques

1. The participant will understand the appropriate use of facilitation and inhibition techniques including, positioning, rocking, tapping, rotation, and pressure.
2. The participant will understand how to apply these techniques to task analysis and training sequences.
3. The participant will learn how to choose appropriate goals given the knowledge of normal development and the development of children with cerebral palsy.

Section IV: Self Care for the Cerebral Palsy Individual

1. The participant will understand the influence of abnormal reflexes associated with the oral mechanism.
2. The participant will be able to name three ways to combat abnormal feeding patterns.
3. The participant will know how to make positioning, clothing and training adaptations when training C.P. individuals in dressing.
4. The participant will know how to make positioning, clothing and training adaptations when training C.P. individuals in toileting.

Specific Objectives

Section I: What is Cerebral Palsy

1. The participant will list the three components of Cerebral Palsy: abnormal tone, presence of primitive reflexes, and developmental delay.
2. The participant will describe movement patterns, postures and problems which are manifested by individuals with cerebral palsy.
3. The participant will list all components of the classification system used to describe different types of cerebral palsy.

4. The participant will list five major areas that should be evaluated when initially meeting a student with cerebral palsy.
5. The participant will demonstrate or identify three abnormal reflexes.
6. The participant will identify normal movement of hip, shoulder, forearm, and hand.
7. The participant will identify or name common limitations or patterns of movement in individuals with cerebral palsy.

Section II: Transfers, Positioning, Management of Equipment

1. The participant will name the following basic parts and functions of a wheelchair when pointed to by the instructor: 1) seat 2) back 3) brake 4) removable arm rest 5) swing away foot rest.
2. After discussion, demonstration and practice with supervision, the participant will verbally describe and perform four types of transfers.
   1) one man dependent lift and carry
   2) two man dependent lift and carry
   3) standing pivot transfer
   4) independent transfer
3. The participant will demonstrate proper body mechanics and transfer techniques for the four transfers listed above.
4. The participant will demonstrate procedures for preparing a child and his/her equipment for transfer. Procedure should include:
   1) placing wheelchair or chair into correct position
   2) locking wheelchair
   3) removing seat belt or other equipment (foot rests side).
5. The participant will demonstrate how to disassemble and reassemble basic parts of a wheelchair 1) removable footrests 2) removable arms 3) removable lap tray.
6. The participant will correctly name and point to the corresponding parts of short leg and long leg braces: 1) thigh and leg cuff 2) caliper 3) joint locks 4) uprights 5) pelvic banc.
7. The participant will demonstrate positioning of a child on a prone board.
8. The participant will demonstrate the ability to remove and replace a short leg and a long leg brace.
9. The participant will name four basic rules regarding good positioning in a chair or wheelchair.
10. The participant will name three positions other than sitting in a chair and the benefits of each position.

Section III: Training Techniques

1. The participant will demonstrate four positions and give a rationale for their use during training.
2. The participant will demonstrate two techniques to inhibit hypertonicity.
3. The participant will demonstrate two techniques to facilitate tone in hypotonic children.
4. The participant will demonstrate a knowledge of how to use physical and occupational therapists as consultants.
5. The participant will demonstrate a knowledge of how to incorporate therapeutic techniques into a training program.
6. The participant will list two books which may be used as resources for therapeutic intervention (Finnie, Levy, Buttram and Brown)
7. The participant will develop two skill sequences to demonstrate a knowledge of normal development.

Section IV: Self Care for the Cerebral Palsy Individual.

1. The participant will name three reflexes associated with the oral mechanism, which interfere with the child's ability to eat.
2. The participant will demonstrate two ways to inhibit the influence of abnormal reflexes.
3. The participant will name three ways to position a child for feeding.

4. The participant will demonstrate the proper way to place a spoon in the child's mouth.
5. The participant will name two positions for dressing.
6. The participant will name two clothing adaptations and their rationale.
7. The participant will name three factors to be aware of in toilet training the C.P. child (sensation, position, fluid intake).
8. The participant will name two clothing adaptations for toileting the C.P. child.

Materials

Instructor Materials

-lecture notes
-Transparencies 1 & 2
-slide tape projector
-screen
-slide tape: "Beyond Survival" parts 1, 2, & 3
-video tape deck and monitor
-video tape on abnormal patterns
-video tape: "Basic Care and Handling"
-wheelchair with removeable arms, swing away foot rests, and lap tray
-short leg braces
-long leg braces
-prone board
-straight back chair
-mat or carpeted floor
-transfer belt

Participant Materials

-1 per participant - *Handling the Young Cerebral Palsy Child at Home* by Nancy Finnie
-1 per participant - *The Baby Exercise Book* by J. Levy
-1 per participant - Physical Management Bibliography
-1 per participant - Handouts 1-6
-1 per participant - copy of lecture notes on clothing adaptations

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Methodology

Section I: What is Cerebral Palsy?

Reading Assignment: Finnie - Chapter 3
Approximate Total Training Time: 3 hours, 35 minutes.

5 min. A. The instructor will lecture on the definition of C.P.
5 min. B. The instructor will lecture on the etiology of C.P.
5 min. C. The instructor will present a brief lecture on associated handicaps.

5 min. D. The instructor will give a brief lecture on prognosis.
30 min. E. The instructor will present information on the classification system.
1. Distribution
   a. hemiplegic
   b. paraplegic
   c. diplegic
   d. quadriplegic
   e. monoplegic
   f. triplegic
   g. double hemiplegic
   h. quadriplegic with hemiplegic focus
2. Muscle tone
   a. reciprocal innervation
   b. spastic
   c. athetoid
   d. hypotonic
   e. ataxic

30 min. F. The instructor will now present information on normal joint movement.

30 min. G. The students will engage in a practicum in range of motion of each other.

25 min. H. The instructor will lecture on abnormal postures manifested in C.P. and review reflexes.

30 min. I. The instructor will provide a video tape or demonstration of abnormal postures.

20 min. J. The instructor will lecture on the evaluation of C.P.

30 min. K. The instructor will provide a video tape or demonstration of a C.P. child for participants to evaluate.

Section II: Transfers, Positioning, Management of Equipment

Approximate Total Training Time: 2 hours.

5 min. A. Transfers

1. The instructor will introduce the video tape "Basic Care and Handling"

35 min. 2. The instructor will show the video tape "Basic Care and Handling"

30 min. 3. Participants will practice in groups of three:
   a. Standing pivot transfer
   b. Two man dependent lift and carry
   c. One man dependent lift and carry
   d. Removal and replacement of short or long leg braces.

B. Equipment

10 min. 1. The instructor will demonstrate the parts of a wheelchair and prone board.

15 min. 2. The participants will practice assembling and disassembling the parts of a wheelchair.

10 min. 3. The instructor will demonstrate wheelchair maintenance of
   a. spokes
   b. tires
   c. brakes

C. Positioning

15 min. 1. The instructor will list the objectives of positioning.

2. The instructor will list the rules of good positioning.

3. The instructor will review aspects of positioning as demonstrated in the video tape. Included should be:
   a. chair
   b. floor sitting
   c. sidelying
   d. prone
   e. supine

4. The instructor will discuss schedule positioning.

5. The instructor will explain precautions to be taken in positioning.

6. The instructor will explain adapted wheel chairs.

Section III: Training Techniques

Reading Assignment: Finnie, Chapter 4

Approximate Total Training Time: 2 hours, 30 minutes.

25 min.	A. The instructor will lecture on the three major approaches to the treatment of C.P.: 1. Orthopedic treatment 2. Neurodevelopmental treatment 3. Rood and related treatments
10 min.	B. The instructor will lecture on the roles of the OT, PT and teacher.
35 min.	C. The instructor will lecture on specific therapeutic techniques: 1. Handling - positioning 2. Inhibition 3. Stimulation 4. Rotation 5. Tapping 6. Proximal joint stability
20 min.	D. The instructor will present a video tape or demonstration of therapeutic techniques.
30 min.	E. The instructor will discuss choosing skill sequences.
30 min.	F. The instructor will lecture on the incorporation of therapeutic techniques into a program format.

Section IV: Self Care for the C.P. Individual

Reading Assignment: Finnie, Chapters 6, 8, 9

Approximate Total Training Time: 2 hours, 10 minutes.

A. Feeding
   1. The instructor will introduce the tapes "Beyond Survival".
   2. The instructor will discuss Part I-Normal Feeding Progression.
   3. The instructor will discuss Part II-Positioning.
   4. The instructor will discuss Part III-Oral Mechanism.
   5. The instructor will demonstrate inhibition and desensitization techniques with a C.P. child.

B. Toileting
   1. The instructor will lecture on normal toileting development.
   2. The instructor will lecture on positioning.

C. Dressing
   1. The instructor will lecture on normal progression.
   2. The instructor will discuss readiness.
   3. The instructor will lecture on positioning.
   4. The instructor will discuss clothing adaptation methods.

Instructor Materials: Lecture Notes

Section I: What is Cerebral Palsy?

A. Definition:

1. It was after World War II that Dr. Winthrop M. Phelps of Baltimore first coined the term *Cerebral* (concerned with the brain) *Palsy* (paralysis) to express the central nervous system damage which resulted in many grades and kinds of muscle and sensory difficulties. (Although Freud has referred to cerebral paralysis in his writings.)
   a. CP is difficult to precisely define because realistically it is a number of disorders.
   b. The following is the 1969 revised definition of the World Commission as presented by Dr. Eric Denhoff at the 1969 American Academy for Cerebral Palsy:

      ". . . . a persistent, but not necessarily unchanging abnormality of posture and movement due to (non-progressive) damage to the central nervous system before its growth and development. . ."

2. The definition contains several important points to be emphasized:
   a. It affects "children." Since the brain begins to plateau development into adult maturity around the age of 18, many states have incorporated this approximate age into legal definitions for cerebral palsy. Hence anyone under the age of (16) 18 (21) may be termed CP if he/she should incur brain damage. Anyone having brain damage after the legal ages may be termed CVA, Cerebral Contusion, or Cerebellar or Cerebral Dysfunction.
   b. It persists throughout life.
   c. There is always some type of disorder of the use of the muscles: i.e., weakness, incoordination, disturbance of tone to varying degrees.
   d. The common denominator of all persons with CP is interference with the developing CNS (i.e., brain damage).
   e. The brain damage is non-progressive, but its manifestations may seem to progress due to physical development and advancing social expectations for performance.
   f. It is not inheritable. Gene structure is not altered by the condition of brain damage.
   g. Damage may be termed "focal" (generally in one area) or "diffuse" (scattered).

3. Incidence:
   a. The national incidence rating of those having CP is approximately two to three per 1,000 live births.
   b. A good number of CP's (depending on environmental conditions) can expect to live a normal life span.

B. Etiology (causes) of CP

1. Forward: When a child is discovered to have CP, the question almost invariably asked by parents, family, and friends is, "Why did it happen?" Though the question is being researched, no definite cause can be found in roughly 30-40% of all cases (1967 statistics).

2. In 1957 a nationwide study, called the Perinatal Collaborative Project, was conducted by teams of 15 leading medical centers to correlate birth histories with incidence of CP.

   Pre-, Peri-, and Postnatal conditions with high correlations to CP

3. Prenatal —
   a. *Anoxia:* Oxygen lack in the brain is often primary among the reasons for the existence of nervous system disorders.

1) Immature brains are specifically sensitive to interference with blood circulation or changes in its chemistry. In monkeys: 8-12 minutes of fetal asphyxia results in early but transient feeding difficulty and clumsy motor skills; 13-19 minutes in mild spasticity or dyskinesia; 20-30 minutes in severe cerebral palsy of all kinds.
2) Anoxia correlates with diagnosis of athetosis.

b. *Prematurity* (correlates with spasticity, diplegia)
1) High risk factors:
a) a mother who smokes
b) infections of the kidney or urinary tract (even slight cases) in the mother
c) mothers younger than 16, or 40 years old and older
d) a mother whose last child was premature has a 30% chance of giving birth prematurely the next time
2) While 10% of all births are considered premature, 36% of these children prove, eventually, to have nervous system abnormalities.

c. *Kernicterus* (Rh factor) (Correlates with deaf athetoid)
1) Process: Because of blood factor incompatibility, the mother's blood builds antibodies against the baby's blood. Normally humans have a low level of bilirubin in the blood; however the mother's antibodies increase the level in the baby's blood so that it is of high enough concentration to penetrate the blood-brain barrier. Bilirubin is toxic to nervous tissue.
2) After birth, bilirubin levels in the baby's blood are "storm" signals.
3) Prevention: blood exchange transfusions (extra- or intrauterine).

d. *Rubella and other infections* (menengitis and encephalitis)
1) If a mother contracts German Measles early in pregnancy (first trimester), fatal or severely damaging infection of the child may occur frequently even if the mother's case is mild.
2) Prevention: vaccination of children and women of child-bearing age if before two months of conception. Vaccine cannot be given to pregnant women as it is a live, though weakened, virus.
3) Infections may cause placenta inflammations.
4) Rubella correlates with deaf spastic.

e. *Toxemias* (especially kidney, diabetes—last trimester) (Correlates with hemi-spastic)
f. *Metabolic*
g. *Inherited* —rare; most common is familial spastic paraplegia.

4. Perinatal—
a. *Anoxia*
b. *Birth trauma* (Correlates with spastic quadriplegic)
1) Induced labor: certain types were found to cause more difficulties than normal deliveries
2) Head injuries: too-large head for mother's pelvis, awkward position for labor, labor too long or short
3) Umbilical cord: squeezing, torsion or other interference
4) Unwise use of forceps in delivery

5. Postnatal—
a. *Anoxia*
b. *Postmaturity*
1) Late delivery also contributes to defects and other complications of the CNS.
2) Condition not as common as prematurity.
c. *Auto accidents*
d. *Hemorrhages*— (spastic hemiplegia)

6. Other
a. X-ray during pregnancy, anemias, abnormal glandular output, tumors
b. Unknown (30%); brain maldevelopment (first 12 weeks)

C. **Associated Handicaps** (CP's are **MULTI** handicapped!)

1. Doctors emphasize that the term cerebral palsy is really just an outline of what is wrong. There are many secondary problems associated with brain damage besides the muscular disturbances.
   a. *Seizures:* controlled with dilantin and phenobarbital
      1) Varying frequencies: seizure only when medication interrupted down to one per every few minutes.
      2) Important to control as brain damage is increased with seizure.
   b. *Mental Retardation:* 75% of all CP's are retarded to some degree. 86% spastic; 12% athetoid. Postnatal——55% spastic hemiplegic; rare athetosis.
   c. *Experiential Retardation:* mother does not have the physical stamina to cart around 25 pound wheelchair, 5-10 pounds of braces, etc.
   d. *Gross sensory deficits:* deaf, blind, astereognostic (define last term).
   e. *Perceptual Motor Dysfunction (Visual-motor):* Even though the organ of sense is intact and the conducting nervous pathways functional, the brain cannot interpret the impulses correctly because of damage.
      1) Leads to learning difficulties, emotional problems.
      2) Can be trained to compensate with other senses.
   f. *Feeding-Speech-Dental problems:*
      1) Feeding:
         a) Abnormal reflexes: gag, bite, thrust, poor lip closure (give brief explanation of each)
         b) Suck and swallow
         c) Infants naturally prefer sweets and will accept more readily, leading to nutrition problems
      2) Speech
         a) Uses the same musculature as feeding. (Some disagreement on this.) Must develop feeding patterns before speech can progress.
         b) Mental retardation may interfere with speech even though musculature is functional.
      3) Oral-dental:
         a) Autostimulation: gaining stimulation for survival from one's own body, being unable to glean it from the environment. Example which causes dental problems is Bruxism (grinding of teeth)
         b) Hygiene: reflexes interfere with cleaning (bite, gag)
         c) Poor nutrition.
         d) Swallowing
         e) Drooling
         f) Tooth enamel malformation
         g) Dental caries
      4) Psychological: 62% suffer emotional stress enough to interfere with getting along comfortably in life.
         a) Many children spoiled by overprotection.
         b) The more near normal I.Q. the more realization of social acceptance deficit.
         c) Over 60% have interferences with levels of consciousness——hyperkinetic, erratic behavior, short attention span.

D. **Prognosis**

1. Favorable in spastic hemiplegia, spastic diplegia, and athetosis.

2. Less favorable in spastic quadraplegia, spastic paraplegia, rigidity, tremors, and in mixed types. Ataxia and atonia are intermediate.

E. Classification System

1. Distribution (Transparency No. 1)
   a. *Hemiplegic:* Involvement of one side of the body, with greater involvement in the arm.
   b. *Paraplegic:* Involvement of both legs with assumed no involvement in the upper extremities
   c. *Diplegic:* Involvement of all four limbs, the legs more than the arms.
   d. *Quadriplegic:* Equal involvement throughout the body, or upper extremity more than lower.
   e. *Monoplegic:* Involvement in one extremity only (very rare)
   f. *Triplegic:* Involvement in three extremities
   g. *Double Hemiplegic:* Involvement of all four extremities. with the arms more than the legs. Opposite of diplegic.
   h. *Quadriplegic with hemiplegic focus:* Involvement in all four extremities with an arm and leg on one side more involved.

2. Muscle Tone
   Definition: Muscle tone refers to the degree of tension or contraction of the muscle. When contraction is constant it provides support for posture. If a muscle contracts or relaxes there is movement (A muscle can also contract in an isometric exercise and not move). There is a constant signal between the Central Nervous System (CNS) and the muscle to maintain a balance between muscles for posture and to provide the muscle tone for contraction or relaxation. This balance is maintained by the stretch reflex and a phenomenon known as reciprocal innervation.
   a. *Reciprocal innervation:*
      1) In the musculoskeletal system, our muscles are put in balance. When one muscle contracts, the other muscle in the pair relaxes.
         biceps-triceps
         adductors - abductors
         This balance is allowed by a hook-up between the muscles and the CNS. In addition to this normal relaxation and contraction, there is a safety mechanism to keep muscles from being stretched too far. If I pick up something heavy and my biceps contract fast and hard the triceps will be triggered to contract so I do not cause a muscle tear or strain.
      2) As part of the reciprocal innervation there are several receptors in the muscle and tendon to keep the balance. Two receptors are in the muscle belly and cause the muscle to contract while a third receptor is in the tendon of the muscle. It is these receptors the therapist is trying to influence when we talk about facilitation and inhibition. Some facilitation is very specific to muscles For example, we may wish to facilitate a contraction of the wrist extensors to counteract a spastic wrist flexor. The therapist will then suggest tapping or vibration to the muscle belly to accomplish the contraction.
      3) Because these balance responses in the muscle and tendon are automatic in the normal individual (but can be controlled consciously) we refer to the response as a reflex and to the mechanism as the stretch reflex. The stretch reflex is a monosynaptic reflex--meaning that when a muscle contracts the message goes into the spinal cord and out without affecting other muscle groups There are however, polysynaptic reflexes.
      4) The polysynaptic reflexes affect more than one muscle group. The asymmetrical tonic neck we discussed in normal development is a polysynaptic reflex. If the child's head is turned, the body responds in a consistent manner. The receptors for this reflex are thought to be in the neck of the child.
      5) In the child with cerebral palsy the reciprocal innervation and the polysynaptic reflexes are out of balance. In some cases the flexor muscles have increased or spastic tone causing them to be in a constant state of contraction. If the flexors are in a constant state of contraction the extensor muscles appear to be weak and

are unable to move. If this constant stretch is maintained the muscle soon loses its elasticity or ability to contract and is no longer functional.

b. *Spastic* - Forty-five percent of all persons with CP.
   1) Definition: Hyperactivity of the muscle stretch reflex.
   2) Hyper irritable: Response may be exaggerated to any stimulus.
   3) Spastic muscles stay in a constant state of contraction, thus stretching the antagonist muscle. If this persists, contractures begin to develop. A contracture is initially a lack of elasticity of the muscle. Without treatment, a contracture eventually results in joint deformity & immobilization.

c. *Athetoid* - Forty-five percent of all persons with CP.
   1) Definition: Generally athetosis is defined as bizarre purposeless motions. Athetosis is better understood as ineffective use of reciprocal innervation, with abnormal stretch reflexes (spindle hypersensitivity).
   2) Subtypes: Rotary, Dystonia, Tremor, Tension

d. *Hypotonic*
   1) Definition: Insufficient muscle tone to maintain posture, especially head control. The joints feel loose and the child feels floppy. This is probably the most difficult to treat even though the child will not develop contractures.

e. *Ataxia:*
   1) Definition: Incoordination and poor balance. Seen as a drunken gait.

F. Lecture: Normal Joint Range of Motion (ROM)

1. "The purpose of this review of ROM is to acquaint you with joint movement, to give you some confidence in handling CP children and to help you understand terminology used by OT and PT. Do not expect to perform passive ROM exercises on your students!"
2. Demonstration on individual.
   Remind participants to position the student on the floor.
   Demonstrate hand position on and around joints.

G. Practicum: Joint ROM

1. Divide into pairs and complete the total range of motion on each other. Questions should be addressed to the instructor. Get a feel for what is normal movement.

H. Abnormal postures manifested in CP. Handout No. 1.

1. Review reflexes using the Barnes, Crutchfield, Heriza chart.
2. The abnormal postures are a combination of several things already discussed.
   a. First is the abnormal muscle tone.
   b. Second the primitive reflexes we just discussed.
   c. Finally the influence of gravity and position on the above two factors.
3. There are some very typical patterns of movement found in the CP child.
   a. Explain the patterns of:

      Head, neck, back extension
      External rotation at shoulders
      Flexion at elbows and hands
      Adduction of hips
      Flexion at knees
      OR
      Flexion of head, elbows, hand
      Extension of legs
      Internal rotation of arms and legs
      Adduction of legs and arms

   b. Have participants try these patterns themselves.

I. Utilize video tape or demonstrate abnormal postures.

J. **Evaluation of CP**
   1. Handout No. 2
   2. Review parts A, B, and C of Handout with participants.

K. **Video tape or demonstration of a CP child for participants to evaluate.**

<u>Section II: Transfers, Positioning, Management of Equipment</u>

Reading Assignment: Finnie Chapters 12, 13 and 14.
Handout No. 3

A. **Transfers**
   1. Video Tape "Basic Care and Handling" includes information on bracing, transfers and positioning. Handout can be used for notes. After the tape, practice the transfers to make sure everyone is using the appropriate body mechanics.
   2. Tape - 36 minutes
   3. Practice in groups of 3 the following transfers:
      a. Standing pivot transfer.
      b. Two man dependent lift and carry.
      c. One man dependent lift and carry.
      d. Removal and replacement of short or long leg braces.

B. **Equipment**
   1. Demonstrate the following parts of a wheelchair and prone board and how to disassemble and assemble the removable parts:
      lap tray
      foot rest
      arm rest
      seat belt
      brakes
      spokes
      tires
      Prone Board:
      standing platform
      appropriate positioning
      protective belts
   2. Practice: Each participant will practice removing lap tray, foot rest arm rest and seat belt.
   3. Demonstrate routine wheelchair maintenance following the handout information:
      spokes
      tires
      brakes

NOTE: Presentation of other adaptive equipment available commercially may be appropriate at this time. However, many positioning and feeding aides will be presented in the slide tape show on feeding. If additional presentations are necessary, Ken Sandler of Iowa Sick Room Supply, Des Moines, Iowa, is available.

C. **Positioning**
   1. Objectives of positioning
      a. Improve use and function of upper extremities for activities such as feeding.
      b. Easier to move person from place to place.
      c. Enhance person's awareness of his/her environment.
      d. Attain good body alignment to prevent deformities such as scoliosis.
      e. Prevent complications such as urinary stasis, abnormal edema, calcium loss, loss of muscle tone.
      f. Improve respiration pattern.

g. Make skin care easier.
h. Decrease the possibility of aspirating food, abnormal reflex contractures etc.
i. Enhance motor development by decreasing reflex activity.

2. Rules for Good Positioning in a Chair (Transparency No. 2)
   a. The individual's hips, knees and ankles should be at 90 degrees or slightly less This inhibits the extensor thrust common in spastic CP. If the child is hypotonic with little head control the angle of hips should be 90 degrees, but the chair may be reclined so gravity will maintain the head position.
   b. Hips should be against the back of the chair. The child should not "slouch" in the chair. If, however, the child has a symmetrical tonic neck reflex and tight hamstring muscles, this position may be difficult if not impossible for him/her to assume. In this case, tailor sitting in the chair may aid in positioning.
   c. The feet should be flat on the floor or supported in some way. There is some controversy on whether or not feet should be held down with restraints. Some therapists believe this only increases abnormal muscle tone. Others feel it is essential for good positioning. This is probably individual and some children will benefit from restraint and others will not. Never-the-less, feet should have a support.
   d. Check seat depth. The child should be able to sit back in the chair and have his/her knees extend out about an inch and a half. If you can get two fingers between the seat and the back of the child's knee, the seat depth is appropriate.
   e. Table or lap tray height should be the proper height. If the child can comfortably rest his/her elbows on the surface, the height is appropriate.

3. Positioning outside a chair.
   a. A supine position is excellent for the child who is spastic. If the child is bound in reflexes and tends to go into extension, a piece of foam or wedge under his/her head should decrease the extension. Padding behind the shoulders to put them into protraction is helpful. This should facilitate over-head reach.
   b. Prone is a recommended position but not if the child tends to flex. If the child assumes a flexed pattern in prone then placing him/her over a wedge with arms reaching over his/her head should inhibit the flexion. This position may also improve head control by facilitating neck extension. Initial supervision of this position may be necessary. If the child assumes an asymmetrical pattern, this position should be discontinued
   c. Sidelying: Sidelying is an excellent compromise between prone and supine for a child who has tonic labyrinthine reflexes and tends to pull into flexion and extension. Place the child on his/her side with top leg flexed and abducted. A pillow placed between the top and bottom leg should help maintain this position.
   d. There are several possible sitting positions.
      1) Tailor Sitting (Indian): This is an excellent substitute for W sitting. It provides a stable base and does not feed into abnormal patterns. One needs to be aware of hip or ankle problems and check with a therapist for proper positioning.
      2) Side Sitting: Side sitting should be encouraged to both sides to decrease the possibility of asymmetry. Make sure it is safe for the hips. Children with dislocated hips may not be able to assume this position and it may be contraindicated.
      3) Ring or Long Sitting. Ring sitting requires the child's legs to be out in front of him/her but knees slightly flexed and legs externally rotated. Long sitting requires the child to sit with legs straight out in front. Long sitting may be difficult if not impossible for children with tight hamstrings or positive symmetrical tone neck reflex.

4. Schedule for positioning.
   a. Children should be repositioned throughout the day to decrease the possibility of pressure sores by improving circulation, to inhibit the influence of reflexes to allow the child to rest.
   b. If a child is in a new position he/she should be moved every 15 or 20 minutes depending on his/her tolerance. As tolerance increases the child may be kept in one position up to two hours.

c. The child should be checked for red marks on his/her skin. If the marks do not disappear after a half an hour then positioning time should be cut back. If the marks are associated with braces or a piece of equipment the therapist should be consulted immediately.
d. Watch for signs of poor circulation such as the skin turning cold and blue.
e. Put the child in as many positions as you can throughout the day.

5. Precautions.
A positioning schedule and plan should be worked out with the therapist. As indicated before certain positions may only exacerbate a deformity or cause the student discomfort. If the child has dislocated hips, scoliosis or other deformities a therapist should be involved in planning for a positioning program.

6. Adapted wheelchairs. (Handouts 4 & 5)
As evident in the slide-tape on feeding, there are numerous special or adapted wheelchairs on the commercial market. Before a chair is purchased for an individual child the teacher and therapist should determine what they wish to accomplish with the chair. For example a wooden relaxer chair was purchased for a child who could sit independently on the floor or a school chair. It was purchased so the child would have some head support when he started engaging in stereotyped head shaking. This was an inappropriate use of a chair which offers full body support. The boy should have been in a regular school chair with perhaps a foot rest. The behavior problem should be attacked from another angle.

A second example involves the child with mild CP who needs some trunk support but may learn to do a pivot transfer. In this case an adductor insert or high rolled seat would be inappropriate if the child is supposed to transfer.

When ordering or designing a chair the teacher and therapist should consider:
a. Function: Is this a chair for positioning the child or simply something Mom will use when she takes junior to the shopping center?
b. Transfers: How do you want to get the child in and out of the chair? Independent transfers require one type of chair while the totally dependent child may require another.
c. Size: Is a wheelchair necessary or will a light weight umbrella chair or smaller car seat on wheels be appropriate? If the chair must be transported daily in the car or van size may be a factor.
d. Adaptations: What adaptations will need to be made? Does the child require head. trunk, hip support, or just a seat belt and lap tray?

Section III: Training Techniques

Reading Assignment: Finnie, Chapter 4; *The Baby Exercise Book* by Levy

A. **Three major approaches to the treatment of CP.**
1. Orthopedic.
The orthopedic approach was the original approach to the treatment of cerebral palsy. The techniques were borrowed from World War I treatments of war injuries and later from the philosophy of the orthopedic treatment of post traumatic paraplegia, and polio (Pearson 1972). In this classic physical approach, techniques included muscle testing and reeducation, ROM, stretching, and training in ADL. In addition, orthopedic surgeons did then and continue to use several surgical procedures with spastics. These procedures include:
a. Operations on motor nerves (Neurectomy) to diminish muscle contraction or spasm.
b. Tendon transplants or lengthening. The tendon transplant involves changing the position of the tendon insertion. Thus if a child has spastic plantar flexors the plantar flexor tendon will be relocated on top of the foot and become a dorsi flexor. In the case of tendon lengthening, part of the tendon is released or cut away so the spasticity is no longer forceful.

c. A final surgical procedure involves stabilization of poorly controlled joints by fusion (Gartland, 1965).

The orthopedic approach may also include muscle relaxer drugs to decrease general rigidity or severe spasticity.

Finally, bracing or splinting have been used to maintain joint mobility and range and to prevent deformities such as permanent contractures.

The orthopedic approach is still in existance today and bracing and surgery are common. This approach is often necessary when therapy is not available on a daily basis. It is also necessary in cases where joint stability is required or where deformities have progressed to the point that surgery and bracing is the only alternative.

The orthopedic approach does have some limitations. Once surgery occurs for example muscle balance is altered and there is no opportunity for the child to control those movements.

Secondly, bracing decreases the opportunity for the child to develop the subtle equilibrium responses emphasized in other treatment approaches. Bracing also puts a constant stretch on muscles. It is believed by many that this constant stretch only stimulates the stretch reflex. When the child is out of his/her braces, spasticity once again pulls the individual into spastic patterns.

Bracing and the remaining approaches are in some respects incompatible. It is recommended that teacher and therapist work closely together to communicate the treatment approach.

2. Neurodevelopmental Treatment (N.D.T.)
This was developed by Karl and Berta Bobath in England. He is a neurologist and she is a physical therapist. They visualize the problems of C.P. children as a combination of abnormal patterns and tone as we have already discussed. Their goal then, is to inhibit postural patterns. They do not work with isolated muscles but with muscle groups. A second goal is to increase the normal qualities of posture by training righting reactions and equilibrium reactions.

Their approach is dynamic. With the assistance of the therapist, the child learns how to move in a more normal manner. NDT involves reflex inhibiting postures which then allow for the facilitation of repetitive tactile and proprioceptive stimulation.

a. They suggest their techniques be used when: (1) There is apparent weakness of muscle groups after hypertonums or intermittent spasms are completely inhibited or reduced in treatment. (2) There is sensory deficit with "weakness" of muscles due to sensory input. (3) There is no actual sensory deficit but the child does not know how to move because of lack of previous sensorimotor experience or because of apraxia. They believe that the younger the child is the better, and prefer to work initially without bracing or surgery.
b. Techniques include: (1) Weight bearing, pressure, resistance, (2) Placing and holding and (3) Tapping. These will be discussed shortly.

3. Roods' Sensorimotor Treatment
This treatment is based on the physiology of the stretch reflex and is quite sophisticated theoretically. The person using this approach must understand muscle physiology as well as have an understanding of anatomy. Facilitation and inhibition works only if the correct muscles receive the input.

Rood and later Farber and Huss, outline this treatment approach as falling into one of two categories. Facilitation for hypotonic child and inhibition, facilitation for hypertonic child. Outlined below are the techniques for each category. However, only a few will be discussed here as viable techniques for teachers.

B. **Lecture - Role of O.T., P.T. and Teacher**

1. It is important to work closely with a therapist because the therapist is knowledgeable in anatomy, motor development, and is aware of medical precautions.
2. We will show how to work with the therapist to incorporate therapeutic techniques into training. Remember, however, your responsibility and liability. If you do not understand, do not proceed.
3. Regulation of P.T. services by the state.
4. Treatment techniques not recommended for teachers include spinning, vibration, and icing/brushing.
5. Treatment techniques presented below should be demonstrated by a therapist. The teacher must be aware of both the positive and negative effects of these techniques.

C. **Lecture on Specific Therapeutic Techniques**

1. Handling and Positioning--The Bobaths have talked about reflex inhibiting postures and control of "key points" which will help teachers handle children. The key points are the head, shoulders and hips/pelvis. Often if one key point is controlled the remainder of the body will relax. This varies with each child so the therapist must experiment with the handling procedures to determine the best method.

   In addition to key points there are certain movements we wish to encourage within a developmental skill.
   Abnormal patterns usually include:
   a. Head, neck, back extension
      External rotation at shoulders
      Flexion at elbows and hands
      Adduction of hips
      Flexion at knees
   b. Flexion of head, elbows, hands
      Extension of legs
      Internal rotation of arms and legs
      Adduction of legs and arms

   Children with C.P. will often use these abnormal patterns for functional skills such as the child who uses ASTNR to extend his/her arm into a sleeve. Our goal is to train motor skills in the normal pattern as much as possible. Therefore it is not just a matter of training reach and grasp but training reach and grasp in a normal pattern.
2. Inhibition——slow, repetitive; used when hypertonicity or abnormal developmental patterns result from CNS damage. Follow by purposeful activity.
   a. Neutral warmth——for——
      1) Hypertonicity
      2) Rigidity
      3) Extreme tension
      4) Painful joints and/or muscles

   Wrap individual in cotton blanket at beginning of treatment period. If water is used, temperature should be tepid, *not hot.* Rebound may result.
   b. Slow stroking——
      Alternate stroking of skin on both sides of spine, firm but light pressure; one hand starts at occiput and progresses down to the coccyx. Before lifting first hand, place other hand at occiput. Maintain continuous contact. *NOTE: Do not use this technique with persons who have hair growth on back that is irregular or in swirls. Not to be done for more than three minutes.*
   c. Slow rolling——supine——place one hand on pelvis and one hand on rib cage; roll from supine to side and return. Roll away from self to avoid facilitating flexion when child's arm hits therapist. Biceps' surface comes into contact. Time- several minutes until signs of relaxing are observed.

d. Rocking in developmental patterns——
   1) Prone——place over ball and rock slowly. Stabilize pelvis.
   2) Sitting——hold in rocking chair; or sit in chair or on mat and rock his/her body in sitting position.
   3) All four's——place in *creeping* position on mat. Place hard cones in hands to inhibit flexors and facilitate extensors. Rock side-to-side, front-to-back, or diagonally. Also can be rocked in *knee walking* position; place hands on hips and rock side-to-side; apply lateral and downward pressure.

e. Pressure on insertion of muscle——for tight muscle group, apply pressure on insertion of muscle, i.e., for wrist and finger flexors place a hard cone in person's hand.

f. Joint compression (can be inhibitory or facilitory). Compression of body weight or less, i.e., prone on elbows.

g. Special senses——
   1) Visual——cool colors are inhibitory; reduce number of stimuli, i.e., turn off excess light.
   2) Auditory——soft, regular rhythms; be aware of speaking voice.
   3) Gustatory and olfactory——warm fluids; pleasant odors.

3. Stimulation——fast, irregular rhythms

a. Pressure——rub muscle belly for facilitation of specific muscle; pounding heels with knees straight facilitates all midline postural muscles.

b. Stretch——
   1) Quick stretch to antagonist muscle inhibits agonist.
      Example——tricep——quickly push arm into increased flexion to facilitate elbow extension.
   2) Maintained stretch——avoid——seems to facilitate flexion, internal rotation, pronation and adduction, i.e., static splints.
   3) Stretch pressure——combine stretch and pressure; apply finger over muscle belly applying pressure, stretch open fingers over muscle belly in direction of fibers.

c. Fast rocking in developmental patterns——see section under inhibition——done in a fast irregular fashion, produces a facilitory effect.

d. Tonic labyrinthine (inverted) reaction——see therapist.

e. Stimulation of special senses
   1) Visual——bright, warm colors
   2) Auditory——fast, loud, irregular rhythms
   3) Gustatory——sweet foods stimulate saliva; milk thickens saliva, makes swallowing more difficult.
   4) Olfactory——noxious odors

f. Tapping——the surface of muscle

g. Follow-up activities
   1) Once stimulation or inhibition has been applied, follow with activity utilizing input on subcortical level.
   2) Direct attention toward activity not the movement or performance itself.
   3) Perform activities in the developmental pattern or position currently being stressed——see the therapists.

4. Rotation--rotation of the trunk is used with children who have spasticity or too much muscle tone. Using rotation helps to break up midline abnormal spastic muscle tone, allowing the child more movement. Rotation should be the first activity of the morning and an unconscious part of handling and positioning throughout the day. (Brown and Buttram, 1978) *Demonstrate.*

5. Tapping--tapping is used:

a. To increase postural tone for the maintenance of posture (pressure tapping). *Demonstrate.*

b. To activate weak muscle groups which cannot contract as a result of reciprocal inhibition by spastic antagonists (inhibitory tapping). *Demonstrate.*

c. To obtain proper grading of reciprocal innervation and to stimulate balance reactions

(alternating tapping). *Demonstrate.*

d. To activate synergic patterns of muscle function by stimulating a specific group of muscles responsible for that action with a sweeping stroke in the direction of the desired movement (sweep tapping). *Demonstrate.*

6. Proximal joint stability/Weighting bearing/Resistance–helping the child to maintain first static positions and then weight shifting and balance are part of program planning. Providing stability to key points, allowing the child to engage in weight bearing activities and adding resistance to movement are all possible ways of facilitation, weight shifting and balance. *Demonstrate.*

D. **Video tape or demonstration on C.P. child.**

E. **Choosing Skill Sequences:**
Review several gross motor goals, breaking down those skills. Point out examples of skills in normal development you do not wish to teach as well as those appropriate to teach.

F. **Incorporation of therapeutic techniques with task analysis and a program format.**
Explain Task Analysis procedures and how to incorporate these with therapy techniques. Have participants task analyze skills.

Section IV: Self Care for the C.P. Individual

A. **Feeding**
Reading Assignment: Finnie Chapter 9.

1. Introduction to the tapes "Beyond Survival"
These tapes and slides contain information on the normal feeding progression, how to position a child with C.P. and how to cope with the abnormal oral reflexes which interfere with feeding.
You have been provided with an outline (Handout No. 6) of some of the terms and the main points to be covered, since the tapes go rather quickly. Please feel free to take additional notes on the handouts. Questions may be asked after each tape, and a demonstration will be presented after the tapes.
2. Part I: Normal Feeding Progression
3. Part II: Positioning
4. Part III: Oral Mechanism
5. Demonstration of inhibition and desensitization techniques with a C.P. child.
   a. Demonstrate the following:
      1) Facilitation of swallowing
      2) Walking on tongue with tongue blade
      3) Lip closure techniques
      4) Gum drop
      5) Straw drinking
      6) Baby food grinder
   b. Points to remember:
      1) Always feed in the correct position
      2) Use textured food, pureed food will only increase drooling
      3) DO NOT use highly sweetened food, this also facilitates drooling
      4) If the child stiffens, do not proceed, let him/her relax
      5) Use the above facilitation techniques prior to meals if possible. Some gross motor inhibition may also be necessary just prior to feeding time

B. **Toileting**
Reading Assignment: Finnie Chapter 6

1. Normal progression for toileting
   a. Sphincter control and the ability to hold fluid in the bladder is the first sign that toilet training is a possibility. If a child is still "dribbling" or continuously wet, he/she may

have immature sphincter control. If, however, the child is dry for periods of one to two hours, then sphincter control has developed and training may be considered.

b. The normal child will develop an awareness of impending elimination but it may be indicated only after the toilet accident. The "I have to tinkle" comes when pants are already wet.

c. A third sign in the normal child in his/her awareness or realizations that puddles on the floor are his/hers.

d. Finally, from 12 months on, the normal child has lots of opportunity to see parents and siblings use the bathroom. Imitation is a factor in the development of toileting skills. Pulling at pants and asking to be changed may also be a part of the developmental pattern.

e. Scheduling time on the potty is usually the first step mothers take when training normal children. If the child eliminates in the potty, the child is praised by a mother with one less diaper to change. Therefore conditioning is an initial step.

f. Indication of toilet needs in anticipation of the event comes around 24 months. Initially the child waits until the last minute but does manage to self initiate. By the time the child is two and a half he/she can plan far enough in advance to come in the house from playing outside or warn parents traveling in a car.

g. By 3 years of age the child can toilet independently, including removing clothes, eliminating, flushing and putting clothes back on. The child will not wipe him/herself accurately.

h. The final step towards independence is taking care of wiping after eliminating.

i. The child with C.P. may have poor sphincter control due to spasticity or immaturity. The child may also have a decreased sensory awareness of a full bladder or impending elimination.

j. The child with C.P. may not be able to move himself/herself to the bathroom or get up on the toilet alone. This should not, however, stop you from training. You will have to make some adjustments in your training program.

(1) First make sure you have the child in a good relaxed position. See Finnie pg. 77. The child who has to balance on the toilet, who startles or is constantly distracted will have more difficulty with training.

(2) Conditioning by controlling fluid intake may be necessary. Schedule drinking and toilet trips consistently during the day during the assessment period.

(3) Try to bowel train using food rather than suppositories. Children with C.P. may have difficulty with constipation because they are not active. Increased fluids and foods that soften stools such as fruit should be encouraged. Work with the parent and nurse. Suppositories should be the last resort.

C. Dressing

Reading Assignment: Finnie Chapter 8

1. Normal Progression:

15 months	Cooperates, will put foot out for shoe, arm for sleeve.
18 months	Can remove mittens, socks, hat, unzip.
24 months	Can remove shoes if laces are untied. Puts arms into large arm holes. Helps with panties. Washes and dries hands unskillfully.
30 months	Unlaces and removes shoes. Pulls pants up and down.

36 months	Unbuttons by pushing it through button holes; buttoning very difficult. Needs assistance undressing, definitely interested in process. Learning to lace shoes. Puts on shoes, not necessarily on correct foot. Doesn't know back from front.
48 months	Dresses and undresses with little assist. Puts shoes on correct foot. Laces shoes, can not tie a bow. Knows back and front of clothes.
60 months	Dresses and undresses self with care, except for buttons and bows in back. Buttons 1" buttons on self.
72 months	Buttons small buttons on own shirt. Ties bows on shoes.

Girls dress themselves before boys. . .more flexible wrist rotation. (Note: This is true of hand washing also.)

2. Readiness

It is sometimes difficult to decide when the child is actually ready for dressing. Usually if a child can sit, has the use of one hand, and has his/her feeding well established, s/he may be ready to be taught undressing. Several areas must be considered first. The answers to the following questions will determine at which level teaching should begin:

a. Cognitive Readiness of Child:
   1) Does s/he imitate motion directions?
   2) Does s/he follow verbal directions?
   3) Does s/he have any perceptual difficulty?
   4) Does s/he relate clothing to appropriate part of the body? (Head into neck opening; arm into sleeve.)

b. Body Balance:
   1) Does s/he sit in a chair with arms?
   2) Does s/he sit in a straight chair?
   3) Does s/he lean free from back of chair?
   4) Does s/he sit on mat or stool?
   5) Does s/he kneel?
   6) Does s/he stand holding with one hand or by leaning?

c. Range of Motion:
   1) Does s/he grasp with one or both hands?
   2) Does s/he place one or both hands over top of head?
   3) Does s/he place one or both hands to back of neck?
   4) Does s/he have opposition with one or both hands?

d. Performance Testing:
   1) Does s/he undress without supervision, except for fastenings?
   2) Does s/he dress without supervision, except for fastenings?
   3) Does s/he undo fastenings?
   4) Does s/he do fastenings?

3. Positioning

For all the following procedures, place the child in the *position* found to be the best for

him/her in the evaluation. Adapted equipment is not necessary; for example, the floor, a sofa, or large easy chair may be used at home providing the child is secure and his/her feet are not left dangling. Use large or stretched out clothing for practice and remove the child's braces if they interfere.

4. Clothing Adaptations and Readiness
   a. Undershirt, Slip-on Sweater, Polo Shirt and Dress
      1) *Duck-the-Head Method:* The child reaches to the back of the neck opening with one or both hands, ducks his/her head and pulls the neck opening forward over his/her head. His/her lead hand then grasps the edge of the opposite sleeve and pulls the sleeve off the arm. The involved hand then pulls the sleeve off the lead arm or the child shakes the sleeve off.

      2) *Arms-out-First Method:* For short sleeves, the lead hand grasps the edge of the opposite sleeve and pulls it forward over his/her elbow as the involved arm pulls back through the armhole. For long sleeves, the child raises his/her involved arm to shoulder level, flexes his/her elbow, then the lead hand grasps the underarm of the sleeve and pulls it down and forward while the involved arm pulls back and out. Follow the same procedure for the other side, with the involved hand now pulling down. The child now takes his/her head out as in the duck-the-head method.

   b. Cardigan, Coat, Jacket and Open Shirt
      1) *Flip-over Method:* This method is particularly good for those unable to place arms behind their back and for the retarded. The child leans forward, ducks his/her head, grasps his/her garment at the back of the neck with both hands and pulls it forward over his/her head. The child then pulls the garment, which is now in front of him/her, off both arms.

      2) *Arms-in-Front Method:* The child puts both hands behind his/her back, pulls the sleeves off the involved arm with the lead hand, then brings arms forward and removes the sleeve from the lead arm.

   c. Trousers, Shirt, and Underpants
      1) *Lying-down Method:* The child pulls his/her garment down over buttocks while s/he rolls from side to side or s/he may arch his/her back and then push garment down. S/he then wiggles his/her body back and out. S/he usually kicks the garment off his/her feet.

      2) *Sitting-up Method:*
         a) Chair: The child braces his/her feet and hoists his/her body, using both hands to push the garment down over the buttocks; or s/he may hoist his/her body with one arm and use the other to push the garment down. S/he finishes by leaning forward and pulling the garment up by the cuffs or hem or s/he simply kicks it off.
         b) Mat: The child starts by pushing his/her garment forward while wiggling his/her body back and out or s/he rolls from side to side while pushing his/her garment forward. S/he finishes by either bending his/her knees close to his/her body and pulling garment off by the cuffs or hem or, for trousers, by crossing legs and pulling one cuff off at a time.

      3) *Kneeling Method:* The child pulls his/her garment down over his/her hips and buttocks, then s/he sits and finishes as in the sitting method.

      4) *Fair Standing Method:* The child holds onto a piece of stable furniture with one arm or s/he leans against it. S/he starts by pushing the garment down past his/her knees with one or both hands and finishes by sitting and pulling off as in other sitting methods or simply steps free of it.

d. Shoes

Shoelaces may be loosened or unlaced if child is unable to do so for him or herself.

1) *Boot-Jack Method:* With his/her shoe wedged in a boot-jack, the child pulls foot out while shoe remains in the boot-jack. Boot-jacks may be purchased in stores dealing in riding equipment or made of wood in the occupational therapy shop.

2) *Rub Method:* The child dorsiflexes ankle and rubs the back of his/her shoe off against the mat or footstool or the toe of his/her other shoe.

3) *Push-Pull Method:* With one foot resting on his/her opposite knee, the child pulls the toe of his/her shoe up with one hand while s/he pulls the heel down with the other hand. This may also be done with the legs uncrossed.

e. Socks

1) *Rub Method:* The child pushes and rolls the sock down as far as possible, using either one or two hands or by rubbing against a mat. S/he then finishes by grasping the toe of the sock and pulling it off.

2) *Hook-and-Pull Method:* The child hooks his/her thumb or fingers at the back of the sock directly above the heel and pulls straight down over his/her heel. S/he then grasps the toe of his/her sock and pulls it off.

5. Dressing

a. Undershirt, Slip-on-Sweater, Polo Shirt and Dress

1) *Duck-the-Head Method:* The child grasps the back bottom of the garment, ducks his/her head forward and pulls the garment over his/her head. Lead hand then holds the bottom open wide while the involved hand pushes through the armhole. Repeat for the lead arm.

2) *Arms-in-First Method:* The child lays the garment flat on his/her lap or on a table, with the front side down. S/he then opens the back bottom of the garment with his/her lead hand and pushes his/her involved arm into the sleeve. The lead hand then pushes the sleeve up past the elbow of the involved arm. Repeat for the lead arm. Lead hand now firmly grasps the back of the garment and pulls it over his/her head. Finish by pulling down all around.

b. Cardigan, Coat, Jacket, and Open Shirt

1) *Flip-over Method:* The child lays the garment flat on his/her lap or on a table with the collar near his/her body and the lining showing. S/he then pushes both arms into the sleeves, or the involved arm first, lead arm second. S/he then ducks his/her head forward while raising extended arms over the head. The child finishes by shrugging shoulders and pulling down.

2) *Pull-from-Front Method:* The child pulls the sleeve over his/her involved arm, lead hand grasps the opposite shoulder and pulls it over his/her head to the other shoulder and gives it to the involved hand to hold. S/he then finds the armhold with his/her lead hand and pushes arm into sleeve.

c. Trousers, Skirt, Underpants

1) *Lying-Down Method:* The child puts both feet, or one foot at a time, into garment and while s/he rolls from side to side, s/he pulls the garment up. Or s/he wiggles forward into the garment by a series of arching movements while pulling up with both hands.

2) *Sitting Method:*

a) Chair: The child holds the garment open and puts both feet in or, with trousers, s/he rests his/her ankle on the opposite knee and puts one pants leg on, then

repeats for the other leg. She then pulls garment up past his/her knees, hoists his/her body with one arm or by bracing his/her feet and finishes by pulling up past the buttocks with one or both hands.

b) Mat: For donning skirt, child holds garment open and puts both feet in. For trousers, s/he crosses involved leg over opposite knee and puts pants leg on; or s/he picks up one leg at a time and, with knee bent close to the body, puts foot into pants leg. Using either method, s/he repeats for the other leg. S/he then pulls garment up past his/her knees and pulls on the rest of the way by wiggling his/her body forward into it, or by rolling from side to side.

3) *Kneeling Method:* Start as in sitting method, on a mat, to get feet into garment. After the garment is pulled up past his/her knees, the child then kneels and pulls it up past buttocks with one or both hands.

4) *Fair Standing Method:* Start as in sitting method, on chair. The child then holds on to furniture with one hand and pulls the garment up with the other, or leans against the wall and uses both hands to pull up.

d. Socks

1) *Scuff or Fold-in-Half Method:* The upper part of the sock is folded back at the heel so that the sock looks like a scuff slipper. The child grasps both sides of the folded sock, puts his/her toes in, and pulls the sock over his/her foot. S/he then grasps the cuff of the sock and pulls it up over his/her heel and up the leg.

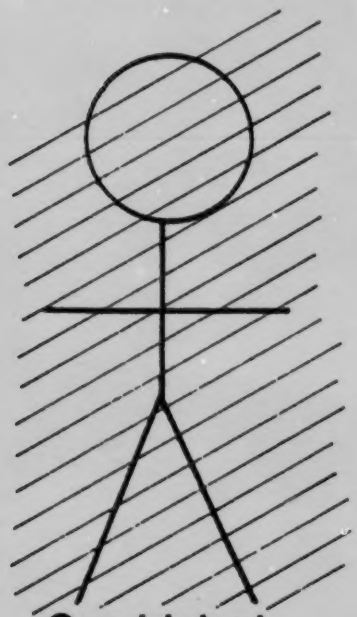
e. Shoes

1) *Box Method:* The shoe is placed in a box in front of the child, or against furniture or wall. The child plantar flexes his/her foot, points toes into the shoe and then pushes foot forward and down.

2) *Shoe-Horn Method:* The child inserts a shoe-horn in the back of his/her shoe, puts his/her toes in and pushes down and forward with his/her foot as s/he removes the shoe-horn. This is especially useful with high shoes.

3) *Pull-Method:* The child rests one foot on the opposite knee or simply lifts his/her foot up. S/he then holds the shoe open in front, including the tongue, plantar flexes his/her foot and pushes his/her toes in while the other hand pushes up on the bottom of the shoe.

Instructor Materials: Transparencies



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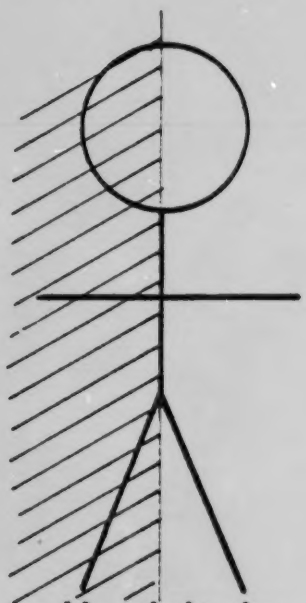

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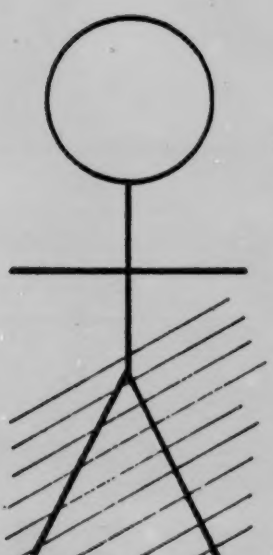

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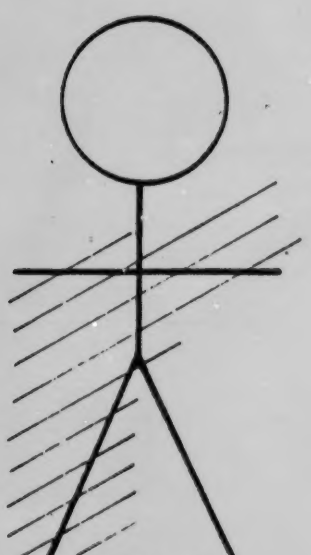
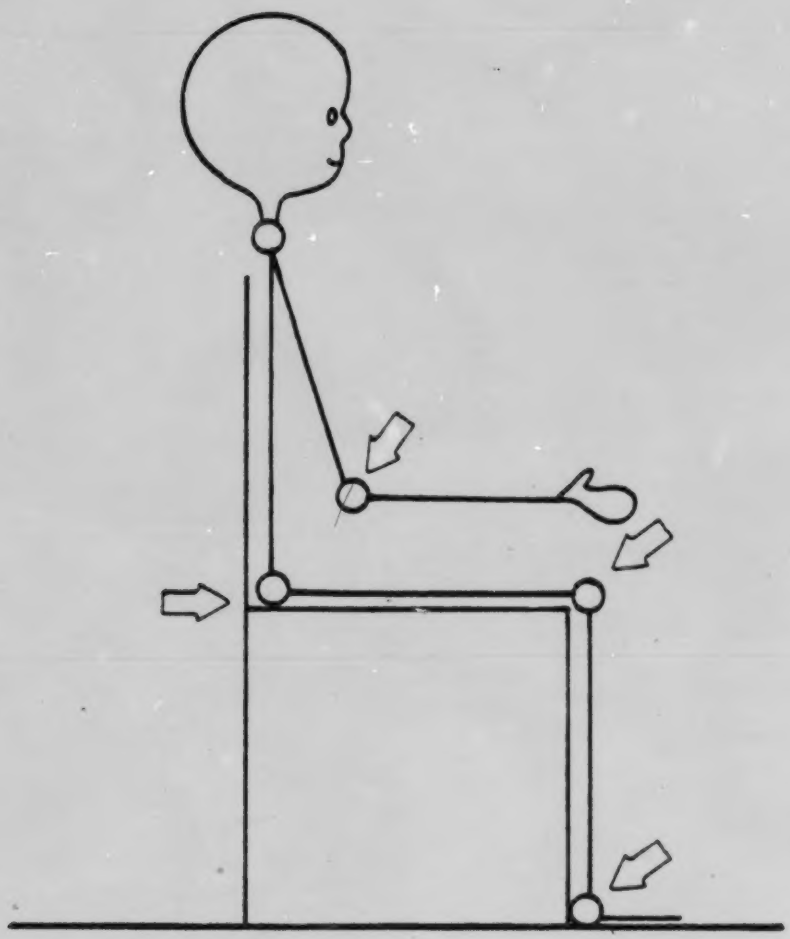


Triplegic

PRINCIPLES OF GOOD POSITIONING



1. Hips, knees, and ankles should all be at 90 degree angles.
2. Hips should be against back of chair.
3. Feet should be supported.
4. Table or lap tray should be at appropriate height (usually elbow height).

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Reflexes

Moro Reflex: The moro reflex is one of the most commonly used reflexes in evaluation of the neurological status of a newborn. It is triggered ay a sudden change in position of the head in relation to the trunk and results in (1) extension and adduction of the upper extremities, opening of the hands and crying, followed by (2) fiexion and adduction of the upper extremities.

Traction Reflex: When you grasp the forearms of an infant and pull him/her to sitting, there is a total flexion response in the upper extremities. The traction and the grasp reflex occur together and allow the child to hold an object monetarily. Voluntary grasping can only occur, however, after this reflex has been integrated to allow for opening of the hands followed by flexion.

Neonatal Neck Righting on Body: In the infant, when the head is turned to the side the body follows as a whole, as in log rolling. There is no segmentation where head, then shoulders, hips, and legs follow in order. This rolling may also be accompanied by a strong extensor thrust in the child with C.P. This is a primitive roll and should not be encouraged or trained. Rather, you want the child to develop segmental rolling because segmental movements are important for higher level skills.

Neonatal Positive Supporting: There are two kinds of positive supporting: primitive and mature. In the primitive positive supporting the child bears partial weight on his/her feet, but the hips are flexed forward. This produces a tendency to stand on tiptoes. This primitive reaction should not be confused with the mature positive supporting where the child bears full weight, hips are extended and feet are flat. Some spastic or hypotonic C.P. are using the primitive positive supporting when "standing" in walkers or bouncing chairs. Children with C.P. should not be put in these pieces of equipment. A therapist should be able to feel how much weight the child is taking and assist that weight bearing.

Asymmetrical Tonic Neck: This is the fencing response where the child turns his/her head and assumes this posture. It is a pattern of response which we as adults still tend to have. It can be obligatory in children. It can also prevent the child from getting hands to midline or mouth, prevent crawling, or cause an asymmetrical gait in walking. This reflex can often be found in children with mild C.P.

Symmetrical Tonic Neck Reflex: When the head is extended, extensor tone predominates in the upper extremities and flexion in the lower extremities. When the head is flexed, flexion tone predominates in the upper extremities and extension in the lowers. This may be seen when the child tries to sit up from a supine position. His/her head and upper extremities flex but the lower extremities extend. This reflex must be integrated before the child can assume the all fours position and crawl. If it is not integrated, the child will bunny hop, sit in W sitting and will sit with a rounded back.

Associated Movements: Associated movements are involuntary movements of the resting extremity when the other extremity is engaged in activity. Associated movements decrease until the age of nine years. Even adults may find that a new and strenuous activity may result in associated movements. Associated movements decrease in the normal individual as neural inhibition occurs. Thus, immature children may continue to exhibit associated movements.

Prehensile Reactions:

Traction

Palmar Grasp: When an object is placed in the hand, the fingers flex around it.

Fractionation of the Grasp Reflex: When one finger is touched on the palmar surface, that finger alone flexes. Thus the beginning of independent digital response.

Hand Orientation: A combination of fractionation or independent finger movements and supination of the hand when touching an object (prior to this the forearm was pronated). This occurs first when the hand is stimulated on the radial side and then on the ulnar side. This orientation occurs in its final form about six to eight months. This corresponds with the end of White's Pre Grasp stage. At this time, the child is not just orienting but also groping for the

object. This combination of fractionation, orientation and instinctive grasp eventually results in pincer grasp.

Righting Reactions: These reactions are the more mature responses to gravity and allow the child to maintain his/her head and body in the upright position. The neck righting action on the body allows for the segmental rolling as opposed to the log rolling in the newborn. Labyrinthine and optical righting keep the head in the vertical position and cause the child to pull to the upright position if he/she is thrown off balance.

Positive Supporting: After the primitive positive supporting reaction disappears, there may be a period of no weight bearing followed by the mature positive supporting reaction. In this mature response, total weight is borne and the hips and knees are in extension. There is no asymmetry. If there is too much extension the child may have the primitive reaction which may lead to structural deformities such as hip dislocation and back kneeing. It will also prevent a normal gait.

Equilibrium Reactions: These are automatic reactions which occur whenever the base of support is unstable. Tilting reactions consist of first a curvature of the vertebrae, followed by a turning of the head toward the upward side as well as extension and adduction of the extremities on that side.

Postural Fixation Responses: These responses are automatic but occur during volitional activity. It involves a bracing of the body or extremity. For example, the basketball player who stands his ground while another runs into him has fixated his body.

These reflexes and reactions must all be considered in evaluating how a child moves and how we want that child to move. We want to train the normal responses rather than the abnormal. Therefore, we are not likely to train the symmetrical tonic neck response or the traction response just because they are part of the developmental sequence. On the contrary, we will try to decrease the influence of those reflexes during training.

Factors to Consider When Evaluating a New Student With Cerebral Palsy

A. Muscle Tone and Distribution

B. Functional Gross Motor Skills

1. Is there head control?
2. Is there trunk control sufficient to sit up?
   stand up?
   walk?
3. What is his/her means of mobility? none
   wheelchair
   rolling
   crawling
   knee walking
   walk with equipment
   independent ambulation
4. If dependent, how is she/he transferred?
   standing pivot
   lift and carry
   independent transfer

C. Functional Upper Extremity Use

1. Can she/he move his/her arms?
2. Can she/he open his/her hands?
3. Can she/he grasp an object?
   spoon?
   cup?
4. Can she/he protect himself/herself from a fall by using his/her hands?
5. Can she/he reposition himself/herself in a chair by using his/her hands?

D. Activities of Daily Living

1. Feeding
   a. Where, how and what is the person fed?
      feeds self?
      pureed foods only?
      fed in supported sitting?
   b. Does she/he drink? Drool?
   c. Does she/he eat most foods? What consistency? Preferences.
   d. Does she/he use special feeding equipment such as bowl or special spoon?
2. Dressing
   a. Does she/he dress himself/herself? If not why? Braces, balance, upper extremity problems, positioning?
   b. Does she/he require special equipment?
3. Toilet Training
   a. Is she/he trained to self initiate?
      Conditioned?
   b. Are there constipation problems?
   c. Does she/he require a special potty chair or equipment?
   d. How does she/he get to the bathroom? Transfer?
      What assistance does she/he require?

E. **Equipment**

1. What equipment does she/he require?
   - wheelchair
   - walker
   - crutches
   - braces
   - splints
   - orthokinetic cuff
   - feeding equipment
   - bathroom equipment
2. How will she/he be positioned in the classroom? Does she/he have an appropriate chair?

F. **Has she/he received the services of P.T. or O.T. before?**

TRANSFER TECHNIQUES

Handout No. 3

I. **Basic Principles**

A. **POSITION YOURSELF *BEFORE* LIFTING!** - Taking a few extra seconds *before* beginning the transfer can make it easier and safer.
   1. Place wheelchair close to bed, chair, etc.
   2. Lock brakes.
   3. Lift foot pedals out of the way and bring patient to the edge of the seat.
   4. Stand close to patient with legs apart.
   5. Bend legs, keep back straight.
   6. Lift by straightening your legs, *not* by straightening your back.
   7. Don't turn by twisting your body. Take several small steps to turn.
   8. If a patient is assisting by holding onto you, have him/her hang onto your trunk, not your neck.

B. With a dependent patient, *DO NOT LIFT ALONE* if possible. Taking on more than you can handle may hurt you and your patient.

C. Practice proper lifting techniques until they become habit.

II. **Types of transfers.**
   A. Independent
   B. Pivot
      1. Minimal assistance
      2. Maximal assistance
   C. Two-man
   D. Toilet
   E. Tub
   F. Shower
   G. Floor

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A. **Wheels**

1. Spokes: Check frequently for loose spokes, at least once a week. If loose, tighten the loose spoke to the same tightness as the other spokes in the wheel. This is done by turning the flat cylinder at the end of the spoke next to the rim counterclockwise when the rim end of the spoke is away from you. Tightening spokes too much will cause a wheel to become out of alignment and will eventually require replacement.

2. Front Casters:
   a. Oil caster bearings at least once every two months. Place a drop of oil on the felt disc.
   b. Semi-pneumatic caster wheels need three drops of oil in the hole in the tire. Allow oil to drain into the bearings and then turn wheel with hole down and allow excess to drain on newspaper.
   c. Remove any hair or lint which has become twisted in the bearing.
   d. Disassemble, clean and grease bearings once a year with auto chassis grease.

3. Tires:
   a. Hard tires--replace if worn or coming loose at the joint.
   b. Pneumatic--pressure must be maintained at 50 pounds per square inch. Replace if worn or severe side wall cracks exist.
   c. Cleaning--clean tires as needed with a damp cloth and cleaner. Wipe cleaner off with a clean, damp cloth.
   d. Check for cuts or splints on either type of tire. Replace if severe.

B. **Brakes**

1. Lubricate once a month at the four pivot points with silicone spray.
2. Adjust brakes at frame if they do not hold or if they are loose.
3. Replace brakes when joints are worn.

C. **Upholstery**

1. Clean with mild detergent such as dish soap at least once a month.
2. Replace if tear begins or severe sagging exists.

D. **Frame and other metal parts**

1. Clean chrome parts with non-abrasive chrome cleaner.
2. If corrosion begins and cleaner does not work, rub area lightly with fine steel wool. Then use auto finish cleaner containing wax.

E. **Legrest length adjustment**

1. If adjustment becomes loose, position foot pedal and tighten adjusting bolt.

F. **Have the wheelchair examined and repaired by a competent, reputable repair center when the following begins to exist:**

1. Pulling to one side
2. Grinding noise in wheel bearings
3. Difficulty pushing
4. Difficulty folding
5. Difficulty in turning corners
6. Crooked wheels
7. Armrests difficult to remove

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Lengthening the Life of Orthoses (Braces)

I. **Orthoses must be lubricated**

A. Where
   1. Ankle joints
   2. Knee joints
   3. Hip joints

B. How
   1. Silicone spray in a spray can is the cleanest, most efficient lubricant when the patient is maintaining an orthosis.
   2. Use a wooden toothpick or match stick, dip end in oil and apply to proper point, an oil can would give you too much oil.
   3. Wipe off excess oil.
   4. Number 30 weight motor oil is about the right consistency for lubricating, 3 in 1 oil is too thin and it runs out, quickly soiling clothing.
   5. Occasionally the orthotist may need to realign and lubricate the orthosis for the patient.

C. When
   1. As necessary.
   2. An active wearer may need to lubricate his/her orthosis twice a week.
   3. Before it becomes obviously needed.

II. **Leather care**

A. Patients consistently ask about washing leather and we do not recommend this for the average patient.

B. Protection of leather is the better technique.
   1. Long stocking for perspiration
      a. Women's leotards
      b. Men's long underwear
   2. Cloth dressing on any particular band where protection is needed.
   3. A full length stockinet may be used on the leg also. If it is stitched on the ends it becomes non-fraying in the wash.

III. **Weekly check list**

A. Loose screws or rivets.
B. Accumulated lint, dust or hair in joints.
C. Worn straps.
D. Worn soles or heels; the metal shoe attachment for your orthosis should never come in contact with the ground.

IV. **Do's and don't for orthoses (braces)**

A. Do respect them as a vital piece of equipment for your health.
B. Don't abuse them unnecessarily, use is not abuse.
C. Do consider having a spare pair of orthoses for the comfort of a daily change and convenience during repair.
D. Do see your orthotist with your persistent problems.

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Part I: Beyond Survival - The Normal Feeding Progression

Newborn -

- Rooting reflex
- Medial lip closure
- Suck-swallow reflex with tongue extension and drooling
- Palmo-mental reflex

4 Months - Tongue evaluation
6 Months - Pre rotary chewing
8 Months - No biting reflex
9 Months - Lateralization of tongue
10 Months - Chewing - food transfer
12 Months - Holds and transfers chewable foods
Glass drinking

Prerequisites for self feeding:

- Head control
- Sitting balance
- Upper extremity function
- Body awareness
- Jaw closure
- Coughing

NOTES:

Why Position:

Prerequisites for feeding independently:

Head control
Sitting balance
Upper extremity function

Position: Head in midline. Body in alignment to provide balance between flexion and extension.
Feet supported

Examples of positioning equipment:

Bean bag chair
Baby sand chair
Adapted Bobby Mac Chair
Mullholland Chair
Encore Chair
Prone board
Barrel seat
Adapted high chair
Regular chair/cut out table

DO NOT USE: Hogg Chair or wooden relaxation chair.

NOTES:

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Part III: Beyond Survival - The Oral Mechanism

Abnormal or Primitive Reflexes:

Startle
Bite reflex (inhibit by stroking face and rubbing gums)
Palmo-mental
Rooting

To facilitate swallowing:

Upward stroking on throat

To facilitate lateral tongue movements:

Walking on tongue with tongue blade
Place food in side of cheek
Assist in lip closure using one of three hand positions.

Ice inside mouth
Gum drop in surgical gauze (to allow the child to chew without fear of gagging)
NO BOTTLE
NO PUREED BABY FOOD
Use baby food grinder available through Sears or Penneys catalogues

Adaptive Equipment:

Straw Drinking:

Use aquarium tubing. First fill the tubing and release it in the child's mouth.
Place tubing on squeeze bottle and push liquid up into tubing.
Require the child to suck on the tubing to get the liquid.

Food should have TEXTURE.

NOTES:

Pretest with Key

1. Write a definition of cerebral palsy that includes: 1) time of onset, 2) the overt manifestations, and 3) the type of condition (progressive or non-progressive).

2. All persons with cerebral palsy are mentally retarded to some degree. True or false.

3. Name two of the most common types of cerebral palsy.

   1. _____

   2. _____

4. List three educationally related negative aspects that result from poor positioning.

5. List the four rules of good positioning.

6. Define contracture.

7. Name three basic types of modifications that can be made to a chair or wheelchair.

8. Name and describe three ways for children to sit on the floor.

9. At what age do the following primitive reflexes usually appear and disappear?

   ____ rooting

   ____ sucking

   ____ ATNR (asymmetrical tonic neck reflex)

   ____ STNR (symmetrical tonic neck reflex)

1. Cerebral palsy occurs before, during or shortly after birth (in children); manifested by disturbance in muscle tone, posture; non-progressive.

2. F

3. Spastic, Athetosis

4. Difficult to move from place to place;
Poor awareness of environment;
Distortion of visual and labyrinthine concepts;
Poor self-concept;
Less chance for improving motor coordination and strength

5. Hips, knees, and ankles should be at 90 degree angles;
Hips should be against back of chair;
Feet should be flat on floor or other support;
Table at proper height

6. Contracture - permanent shortening

7. Seat belts or other restrainers;
Cushions;
Footboards

8. *(Side sit)* is with both legs to one side
(Long sit) is with both legs stretched in front of the individual
(Tailor sit) with the knees bent sharply and the legs crossed

9. 0-3 months
0-3,5 months
4-6 months
4-6 months

Post-test with Key

1. Cerebral palsy is a disease. True or false.

2. List three common disabilities associated with cerebral palsy.

3. List and briefly define three types of limb distributions found in cerebral palsy.

4. Briefly define:

   spasticity—

   athetosis—

   reciprocal innervation—

   contracture—

5. List three detrimental medically related aspects that can be prevented or minimized by proper positioning.

6. Name four basic rules regarding good positioning in a chair or wheelchair.

7. Name two forms of floor positions.

8. Match the reflexes and their definitions.

   1. ATNR
   2. Protective extension
   3. STNR
   4. MORO
   5. Rooting

   a. When stimulated near mouth, head turns toward stimuli.
   b. Total extension pattern in response to a loud noise or sudden change in head position.
   c. Arms thrust forward to break a fall.
   d. Reflex which needs to be integrated prior to reciprocal crawl.
   e. Child assumes the fencing position when head is turned.

9. List three major considerations when initially encountering a severely involved CP individual assigned to your class.

10. Name two things the teacher needs to do to prepare for a transfer.

11. Children with adapted wheelchairs should stay in the chair all day. True or false.

12. List two general approaches to the treatment of CP.

13. Name two techniques a teacher can use on a
    a. hypotonic child

    b. hypertonic child

14. Name two reflexes of the oral mechanism which interfere with feeding.

15. Name two techniques used to overcome reflexes of the oral mechanism and what those techniques are designed to accomplish.

Post-Test Key

1. F

2. Seizures, perceptual-motor deficits, blind, deaf, other sensory impairments, mental retardation, dental, nutrition, speech, psychological.

3. i.e. hemiplegia, diplegia, quadriplegia, etc.

4. Spasticity — hypertonus of the muscles.
   Athetosis— bizarre, purposeless motions.
   Reciprocal Innervation —
   Innervation of muscles around the joints, where the motor centers are so connected in pairs that when one is excited, the center of the corresponding antagonist is inhibited; when a stretch reflex occurs in the agonist, the antagonist muscle relaxes to allow range of movement at the joint.
   Contractures— a loss of elasticity in a muscle resulting in immobilization.

5. Contractures, edema, loss of muscle tone, pain, dislocation of hips, scoliosis, urinary stasis

6. Hips, knees, and ankles should be at 90 degree angles.
   Hips should be against back of chair.
   Feet should be flat on floor or other support.
   Table at proper height.

7. Sitting, lying

8. 1 - e
   2 - c
   3 - d
   4 - b
   5 - a

9. Social-emotional
   Motor
   Health factors
   Equipment
   Communication

10. Position chair
    lock wheelchair
    position self

11. False

12. Orthoped
    NDT
    Rood

13. hypotonic:
    tapping
    fast rocking in developmental pattern

    hypertonic:
    slow rolling

14. suck, swallow, tongue
bite
rooting

15. a. rubbing gums to decrease bite reflex
b. tongue blade walking to decrease tongue thrust and promote lateral tongue movements
c. gum drop in gauze

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Bibliography

Section I: What is Cerebral Palsy?

Amatruda, S., Gesell, A. Developmental Diagnosis, Normal and Abnormal Child Development, 2nd Ed. New York: Harper & Row, 1947.

Barnes, M.R., Crutchfield, C.A. and Heriza, C.B. The neurophysiological basis of patient treatment. Volume II Reflexes in Motor Development. Morgantown, West Virginia (26505): Stokesville Publ. Co. Box 4016, 1978.

Bleck, E., Nagel, D. Physically Handicapped Children: A Medical Atlas for Teachers. New York: Grune & Stratton, Inc. 1975.

Bobath, K. & Bobath, B. An analysis of the development of standing and walking patterns in patients with cerebral palsy. Physiotherapy, 1962, 48, 144-153.

Bobath, B. Abnormal Postural Reflex Activity caused by Brain Lesion. Wm. Heinemann Med. Bks. Ltd., 1965.

Bobath, B., & Bobath, K. Cerebral palsy. In P.H. Pearson & C.E. Williams (Eds.) Physical Therapy Services in the Developmental Disabilities. Springfield, Illinois: Charles C. Thomas, 1972.

Denhoff, E. Cerebral Palsy -- The Preschool Years. Springfield, Illinois: Charles C. Thomas, 1967.

Dunst, C.J., Kinsey, T., Johnson, D. & Crouse, C. Abnormal movement patterns in cerebral palsied children as a function of sensorimotor training. Western Carolina Center Paper, 4(10), 1974.

Fiorentino, M.R. Reflex Testing Methods for Evaluating C.N.S. Development. Springfield, Illinois: Charles C. Thomas, 1973.

Pearson, P.H., & C.E. Williams (Ed). Physical Therapy Services in the Developmental Disabilities. Springfield, Illinois: Charles C. Thomas, 1972.

Pieper, A. Cerebral Function in Infancy and Childhood. New York: Consultants Bureau, 1963.

Johnston, R.B. Motor function: Normal development and cerebral palsy. In R.B. Johnston, & P.R. Magrab (Eds) Developmental Disorders, Assessment Treatment, Education. Baltimore: University Park Press, 1976.

Section II: Transfers, Positioning and Equipment

Bergstrom, D. & Coles, C.H. Basic positioning procedures. Minneapolis, Minn.: A-V Publications Office, Sister Kenny Institute, 1971.

Flaherty, P.T. & Jukovich, S.J. Transfers for patients with acute and chronic conditions. Minneapolis, Minn.: A-V Publications Office, Sister Kenny Institute, 1970.

Hoffman, R.B. How to build special furniture and equipment for handicapped children. Springfield, Illinois: Charles C. Thomas, 1970.

Macey, P.B., Stancliffe, J., Beumer, B., & Roper, W. Mobilizing multiply handicapped children---A manual for the design and construction of modified wheelchairs. Lawrence, Kansas: Division of Continuing Education, U. of Kansas, 1971.

Robinault, I.P. Functional Aids for the Multiply Handicapped. Hagerstown, Maryland: Harper and Row, Medical Department, 1973.

Rosenberg, C. Assistive devices for the handicapped. Minneapolis, Minn.: A-V Publications Office, Sister Kenny Institute, 1968.

Rux, R.E. Suggestion from the field: Standing platforms for nonambulatory patients. Physical Therapy, 1971, 51, 9.

Section III: Training Techniques

Bobath, B. Treatment principles and planning in cerebral palsy. Physiotherapy, 1963, 49, 122-124.

Bobath, B. The very early treatment of cerebral palsy. Developmental Medicine and Child Neurology, 1967, 9, 373-390.

Bobath, K., & Bobath, B. The facilitation of normal postural reactions and movements in the treatment of cerebral palsy. Physiotherapy, 50, 1964.

Chandler, S.S. & Adams, M.A. Multiply handicapped children motivated for ambulation through behavior modification. Physical Therapy, 1972, 52 (3) 399-401.

Crickmay, M.C. Speech therapy and the Bobath approach to cerebral palsy. Springfield, Illinois: Charles C. Thomas, 1966.

Cratty, B.J., Motor Activity and the Education of Retardates. Philadelphia: Lea & Febiger, 1969.

Farber, S.D. Sensorimotor Evaluation and Treatment Procedures for Allied Health Personnel. Indianapolis, Indiana: The Indiana University Foundation, 1974.

Finnie, N.R. Handling the Young Cerebral Palsied Child at Home. New York: E.P. Dutton, and Company, 1970.

Ethun, C.A. & D'Angelo, R.J. Gait training for the severely mentally retarded. Journal of the American Physical Therapy Association, 1963, 43, 179-180.

Horner, R.D. Establishing use of crutches by a mentally retarded spina bifida child. Journal of Applied Behavior Analysis, 1971, 4(3), 183-189.

Levy, J. The Baby Exercise Book. New York: Panheon Books, 1973.

Loynd, J. & Barclas, A. A case study in developing ambulation in a profoundly retarded child. Behavior Research & Therapy, 1970, 8 (2), 207.

MacAulay, M.E. & MacMillan, M. Teaching severely retarded children to walk. Developmental Medicine and Child Neurology, 1965, 7, 549-566.

O'Brien, F., Azrin, N.H. & Bugle, C. Training profoundly retarded children to stop crawling. Journal of Applied Behavior Analysis, 1972, 5(2), 131-137.

Spackman, C.S., Willard, H.S., Occupational Therapy, 4th Edition. Philadelphia: J.P. Kippincott, 1971.

Scarnati, R. The role of the physical therapist in special education. Rehabilitation Literature, 1971, 32, 130-138.

Wilson V., & Parks, R., Promoting ambulation in the severely retarded child. Mental Retardation, 1970, 8, 17-19.

Touwen, B., Neurological Development in Infancy. Spastics International Medical Publication. Laverham, Sufflok, England: Lavenham Press Ltd. 1976.

Newman, R., Orrs, P., McCann, B., Menolascino, F.J. & Heal, L.W. Experimental evaluation of sensorimotor patterning used with mentally retarded children. American Journal of Mental Deficiency, 79 (4) 372-384, 1974.

Buttram, B. & Brown, G. Developmental Physical Management for the Multidisabled Child. The University of Alabama, P.O. Box 2592 University of Alabama 35486.

Section IV: Self Care for the Cerebral Palsied Individual

Bare, C., Oettke, E. & Waggoner, N. Self-help clothing for handicapped children. Chicago, Illinois: National Association for Crippled Children and Adults, 1962.

Copeland, M., Ford, L., Solon, N. Occupational Therapy for Mentally Retarded Children. Baltimore, Maryland: University Park Press, 1976.

Eddington, C., Spoon feeding your child. State of Utah, Department of Social Services, Division of Health - MCH, 44 Medical Drive, Salt Lake City, Utah.

Eddington, C. Teaching your child straw drinking to encourage sucking. State of Utah, Department of Social Services, Division of Health - MCH, 44 Medical Drive, Salt Lake City, Utah.

Holser-Buehler, P. The Blanchard method of feeding the cerebral palsied. American Journal of Occupational Therapy. 10 (1), 1966.

Institute of Rehabilitation Medicine. Bibliography on self-help devices and orthotics: 1950-67. Rehabilitation Monograph 35. New York: New York University Medical Center, 1968.

Lowman, E. & Klinger, J.L. Aides to independent living: Self-help for the handicapped. New York: McGraw-Hill, 1969.

Palmer, M.R. Studies in clinical techniques II. Normalization of chewing, sucking and swallowing reflexes in cerebral palsy: a home program. Journal of Speech Disorders, 1947, 12, 415-418.

Schmidt, P. Feeding Assessment and therapy for the neurologically impaired. American Association for the Education of the Severely/Profoundly Handicapped Review. November, 1976, 1(8), 19-27.

Slominski, A. Please Help Us Help OUrselves. Indianpolis, Indiana: Cerebral Palsy Clinic, Indiana University Medical Center, 1970.

Zelle, R. Procedure to reduce sensitivity to texture and promote oral hygiene. Sacramento, California: Alta Regional Center, 1974.

Tapes and Slides

"A Normal Baby: The Sensory Motor Process of the First Year," University Hospital School, Black and white 3/4 inch video cassette, U-Matic, HS No. 26002, University of Iowa, Iowa City, Iowa 52242.

"Basic Care and Handling," University Hospital School, Color 3/4 inch video cassette, U-Matic, HS No. 26000, University of Iowa, Iowa City, Iowa 52242.

"Beyond Survival: The Feeding Experience - Normal Progression of Feeding," University Hospital School, Slide/tape (1000hz), HS No. 42001, University of Iowa, Iowa City, Iowa 52242.

"Beyond Survival: The Feeding Experience - Positioning the Child with Neuromuscular Handicaps," University Hospital School, Slide/tape (1000hz), HS No. 43002, University of Iowa, Iowa City, Iowa 52242.

"Beyond Survival: The Feeding Experience - The Oral Mechanism and Related Factors," University Hospital School, Slide/tape (1000hz), HS No. 45000, University of Iowa, Iowa City, Iowa 52242.

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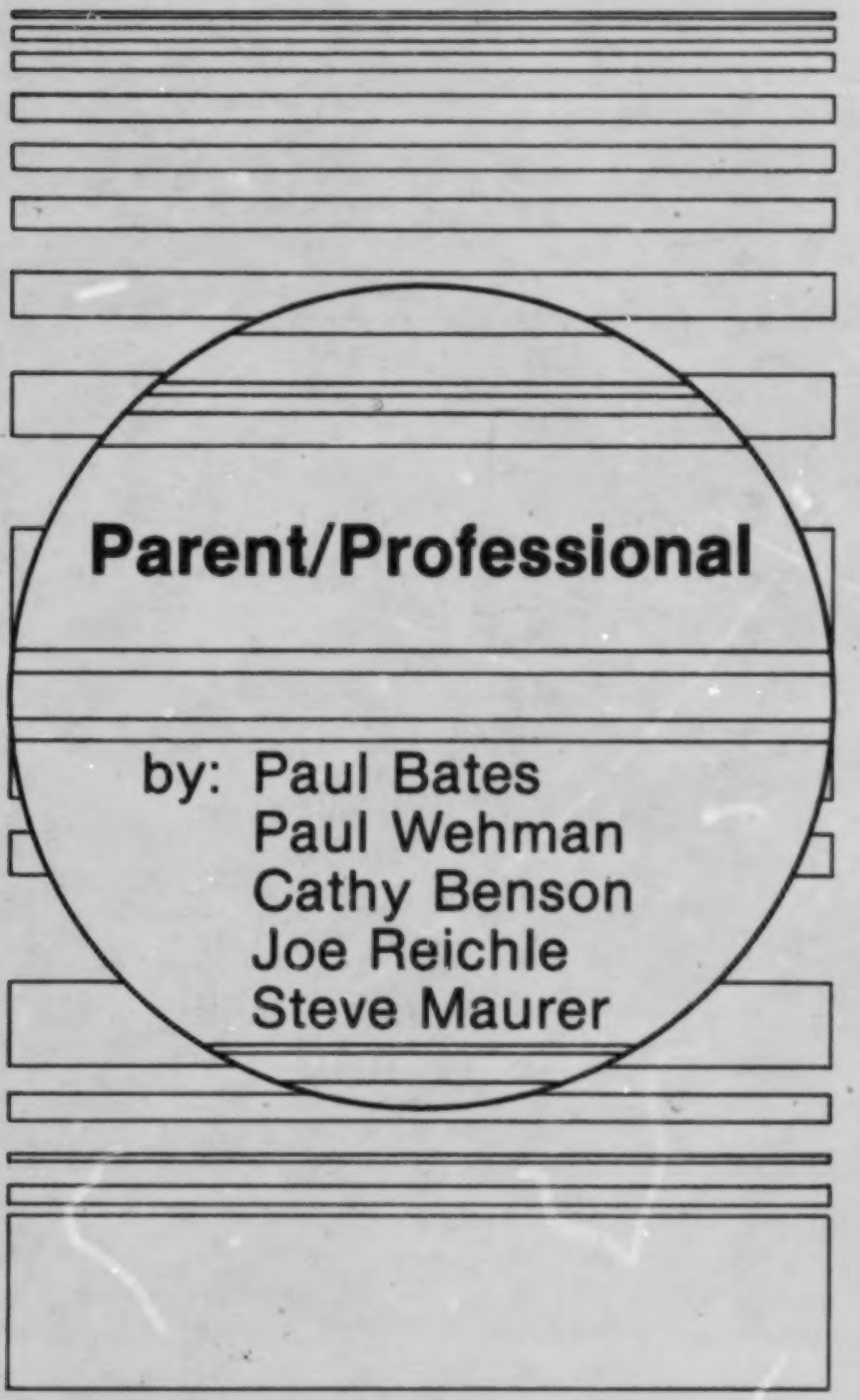
Parent/Professional
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Paul Wehman
Cathy Benson
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Overview

The goal of this module is to provide teachers with information relevant to training families of severely/profoundly handicapped (SPH) students. It is also concerned with discussing methods and issues involved in training paraprofessional workers such as teaching associates and volunteers. The primary areas covered include:

a) Introduction and Rationale
b) Organizing Family Groups for Training
c) Assessment
d) Social Learning
e) Community Resources
f) Legal Rights and Due Process
g) Paraprofessional Training

Unquestionably, the involvement of families in the education process of the SPH child is critical. Without follow through in the home, the child receives less than 30 hours a week in actual instructional time. The lack of continuity between the child's two principle living environments, the home and school, can confuse the child thereby inhibiting learning and maintenance of skills.

Parents need to be aware of their legal rights and due process, they should have a realistic set of expectations about their child's future development, and must have a grasp of positive management techniques. This module emphasizes these areas and identifies ways for teachers to communicate with parents effectively.

If this module must be significantly shortened because of time limitations, it will be best to omit paraprofessional training and limit the amount of material covered in each of the other sections. Even in a shortened module, it is still best to cover most of the areas, if only in limited depth.

Objectives

General Objectives:

1. The participants will understand the need for a family involvement program in conjunction with the education of the severely handicapped.
2. The participants will be introduced to communication skills which can facilitate a close home-school relationship.
3. The participants will be informed of several components which are involved in a family education program, and be aware of methods which have proven useful for organizing groups of parents.
4. The participants will be aware that "special" families (e.g., minority or one parent families) may require a unique approach.
5. The participants will be informed of several assessment techniques that may be utilized in working with families.
6. The participants will be familiar with the components that should be included in social learning instruction with families.
7. The participants will be exposed to a variety of feedback channels to be utilized with families, and take part in a constructive criticism exercise.
8. The participants will be familiarized with programmed texts which are designed to teach social learning skills to families.
9. The participants will become familiar with a variety of community services which should be available to the severely handicapped and their families, and will read and discuss issues regarding legal rights of mentally retarded citizens.

Specific Objectives (Family Training):

The participants will be able to:

1. List three reasons why a family involvement program is important to the educational experience of the severely handicapped.
2. Provide an alternative program description to "Parent Training."
3. Describe and practice using at least two communication skills which can be used to facilitate rapport with family members.
4. List the necessary components of a comprehensive family education program.
5. List a minimum of three advantages of working with families in groups as opposed to individual consultation.
6. List three necessary arrangements that should be made prior to conducting an initial group session with families.
7. List a minimum of five reinforcers that a teacher might utilize with a group of families to maximize their involvement in an education program.
8. Identify and describe three techniques which the teacher might utilize to increase group cohesion.
9. Identify and describe three techniques which can be utilized to work with a difficult member of a family group.
10. When given a particularly unique family (e.g., minority, single parent, mentally retarded parent, etc.), describe arrangements which would best meet this family's needs.
11. Identify and describe three areas which should be included in a total family assessment.
12. Identify and describe a minimum of six components that should be included in a social learning instruction with families.
13. Describe an exercise to teach behavioral specificity.
14. Provide a response to a parent who refuses to use reinforcement because "it is bribery."
15. Discuss considerations that should be given in developing charts and graphs for home use.
16. Describe how you would explain to a parent how to implement a time out procedure.
17. Identify and describe three essential ingredients of a contingency contract.
18. List three feedback techniques which an educator might utilize in working with families to teach them social learning skills.

19. Identify three programmed texts which are available for home-school education programs.
20. List steps that you would take to prepare families to maintain skills beyond your direct involvement with them.
21. Identify a minimum of six community resources that should be available to families of the severely handicapped.
22. List three parent organizations and/or professional organizations that parents can join.
23. Describe at least three legal issues that have importance for educators and families of the severely handicapped.

Specific Objectives (Paraprofessional Training):

24. The participant will recognize the different groups of paraprofessionals which may be utilized to help with classroom programming.
25. The participant will understand how to optimally utilize college practicum students and foster grandparents, and other community volunteers in program planning.
26. The participant will identify the core of basic competencies which teaching associates should exhibit.
27. The participant will understand how to implement specific procedures for training teaching associates in observation and recording skills, instructional strategies, adaptation of materials and behavior management skills.
28. The participant will understand the importance of integrating the teaching associate into classroom programming and providing the associate with significant program responsibilities.
29. The participant will recognize the need for providing the teaching associate with structured corrective feedback and reinforcement for successful work with students.

Materials

Instructor Materials

-overhead projector
-screen
-transparencies and marking pens
-blackboard and chalk
-paraphrasing game cards
-paraphrasing role play
-perception checks script which is analyzed
-perception checks role play
-role play for all four communication skills

Participant Materials

-1 pre/post test per participant
-1 copy "Parent Involvement Programs-A Growing Trend in Special Education"
- 1 copy per participant of "The Parent-Professional Partnership"
-1 copy per participant of "A Parent's View of What Public Education Should Accomplish"
-1 copy per participant of "The Rights of Children and Their Parents"
-1 copy per participant of Q-Sort board and envelope of squares
-1 copy per participant of "Basic Skills for Discussing Interpersonal Relations"
-1 copy per participant of Observation Form I
-1 copy per participant of Selected role plays
-1 copy per participant of Observation Form II
-1 copy per participant of script: perception checks
-1 copy per participant of Observation Form III
-1 copy per participant of "Issues" activity sheet
-1 copy of Observation Form IV per participant
-1 copy per participant of Observation Form V
-1 copy per participant of "The Search for Reinforcers to Train and Maintain Effective Parent Behaviors"
-1 copy per participant of Social Learning Chart (pp. 1 & 2)
-1 copy per participant of "Behavioral Specificity and Target Identification" worksheet
-1 copy per participant of "Contingency Contract: Hand-out"

-1 copy per participant of "Construction Criticism"
-1 copy per participant of "Community Services Necessary for the Severely/Profoundly Handicapped"
-1 copy per participant of bibliography

Methodology

Introduction

Note to Instructor: I.A. refers to Instructional Activity; Handout article: "Parent involvement Programs–A Growing Trend in Special Education"

15 min. Pretest

15 min.

1. The instructor will introduce this module with a discussion of the reasons for family involvement in the educational experience for the severely/profoundly handicapped individual. (Refer to I.A. Notes) Following this presentation the instructor might choose to ask the following questions:
   a. Are there any questions about the inclusion of any of the reasons for family involvement?
   b. Can anyone think of any additional reasons for such involvement?

5 min.

2. Following this discussion of the reasons for family involvement, the Instructor will discuss the various connotations of "Parent Training." The desirability of different descriptors (Refer to I.A. Notes) will be addressed. After this presentation, the instructor should attempt to enlist the opinion of the participants on this topic. Additional program descriptors could be written on the blackboard or overhead projector.

60 min.

3. The instructor next hands out several articles including "The Parent-Professional Partnership," "A Parent's View of What Public Education Should Accomplish," and "The Rights of Children and Their Parents." After these are read, the instructor will ask the participants their opinion on the material. The following question should be asked by the instructor to stimulate the participants thinking along a related subject: "Who should be considered the expert on the severely handicapped individual - parent or professional?" (Refer to I.A. Notes)

330 min.

4. At this time the instructor emphasizes the importance of being able to communicate effectively with parents. The instructor states that working with families becomes an interaction process in which rapport is established before information is disseminated. The importance of active listening is stressed. Following this the instructor will pass out exercises involving the use of effective communication skills. (Refer to I.A. Notes) After the group has completed dyad practice of these communication skills, the instructor will reconvene the group and ask each dyad to report on how useful these techniques appear to be.

60 min.

5. The instructor should now introduce a parent of a severely handicapped child who has volunteered to come and share experiences in dealing with the school system and other professionals. This parent must be a dynamic individual who is able to honestly express perceptions of the manner in which school-home communication has been in the past as well as feelings about other issues centering on having a handicapped child in the family. Following this presentation, the instructor should encourage a discussion between the participants and the parent. At the conclusion of this discussion, the instructor may choose to ask the participants a few questions about what they felt contributed

to both good and bad communications between families and school personnel. These contributions by the participants could be written down on the blackboard or overhead projector.

15 min.

6. At this time the instructor should write the following 3 column headings on the blackboard: 1) *Essential Components,* 2) *Why,* and 3) *Time.* The trainer will now ask the participants what they think are the important components involved in a school-family education program. After the participants supply the content the instructor will follow by having them mustify each component, and suggest a tentative timeline. The instructor should encourage group discussion on each component, its rationale, and timeline. (Refer to I.A. Notes)

Organizing Family Groups for Training

5 min.

7. The instructor introduces the topic of group organization by emphasizing that whatever the content area involved, similar techniques are required of the classroom teacher who wants to organize a group of parents.

5 min.

8. The instructor will next present a few of the advantages of working with family members in a group. (See I.A. Notes) After this presentation the instructor will record additional advantages and potential disadvantages of a group approach on the blackboard. The instructor should stress that the group approach is certainly not for everyone. Certain families have unique situations which call for a more individualized approach.

10 min.

9. At this time the instructor will present several arrangements which might be made prior to a group session. These arrangements are designed to maximize attendance and participation of family members. The instructor will hand out the article "The Search for Reinforcers to Train and Maintain Effective Parent Behaviors" and have the participants read the "Pre-Workshop Arrangement" sub-section. (Refer to I.A. Notes)

10 min.

10. The instructor next will have the participants read the "Workshop Reinforcers" section of the article. As the participants are reading this section, the instructor will point out several types of reinforcers which might be utilized in working with families. (Refer to I.A. Notes) After presenting several of the potential incentives available to utilize with parents, the instructor should encourage each participant to comment on the practicality as well as limitations of any of the incentives which have been presented. Furthermore, the instructor should encourage the participants to add any techniques which have aided their past relationships with families of the severely handicapped.

10 min.

11. Since group cohesion may enhance the effect of a group training experience, the instructor should at this time present a few methods which have proven useful for increasing the attractiveness of groups. (Refer to I.A. Notes)

5 min.

12. The instructor should acknowledge the fact that in every group there may be an individual or group of individuals whose presence is detracting from the benefit of the majority. The following strategies are to be suggested by the instructor, with comments and alternatives encouraged from the participants:

a. Use the group to problem solve without specifically targeting on the difficult individual (e.g., "We seem to be getting off the subject at times and thus not allowing time for each individual to present their program. What do you think we can do about it?")
b. Privately contract with individual but still maintain in group.
c. Arrange for individual consultation rather than group involvement.

10 min.

13. After a discussion of methods useful in working with difficult group members, the instructor will introduce an exercise designed to stimulate the participants' thinking about unique approaches which are possible with special families. The trainer assigns groups of 2 to 3 participants one of the following types of families: minority families, single parent families, mentally retarded parents, family that refuses any involvement with the school, family in which only one parent will become involved. Each of the groups of participants should be given time to discuss their topic and then report back to the large group for discussion.

Assessment

5 min.

14. The instructor will introduce the topic of assessment by stressing the importance of a strength based assessment. (Refer to I.A. Notes)

15 min.

15. At this time, the instructor will ask the participants what information they feel is important for family assessment. As the participants provide the input, the trainer will list each item in a column on the blackboard titled "Family Assessment." To the right of this column the trainer should write "Strengths." If the participants have difficulty in arriving at suggestions for family assessment, the instructor should stimulate their thinking about the following categories:
    1. Behavior management techniques
    2. Use of positive reinforcement
    3. Usual daily activities
    4. Skills the handicapped child uses at home
    5. Family use of community resources
    6. Extended family support system
    7. Parental expectations
    8. Family economic situation

15 min.

16. After a discussion of the different categories of assessment, the instructor will present material on the feasibility of various assessment techniques. (Refer to I.A. Notes) Following the presentation of the various assessment techniques, the instructor should ask for comments and additions from the participants.

Social Learning

20 min.

17. The instructor will introduce this section with a presentation of the components recommended for inclusion in social learning instruction with families. As the instructor briefly explains each component, the itesm should be written on an overhead projector or blackboard. (Refer to I.A. Notes)

5 min.

18. After presentation of the social learning components, the

instructor should ask if there are any questions about those components included and if anyone has suggestions for additions.

19. The instructor next informs the participants that as a group they will now have the chance to practice techniques for teaching the various components to family members.

20 min.

20. At this time the instructor will hand out an exercise on behavioral specificity. The participants will pair off in dyads to work on the example situations (see handout). The participants are to take turns acting as consultant to one another in assisting each to specifically define the behavior involved. After approximately 10 minutes, each dyad will report their behavioral descriptions. The instructor should encourage group feedback on the consultation process as well as the end products - the behavioral descriptions.

10 min.

21. The instructor will hand out a few example charts and graphs that might be utilized by family members. The participants will be asked to comment on the content, practicality, and utility of each example.

15 min.

22. The instructor will now introduce the participants to an exercise designed to teach family members concepts of reinforcement. (Refer to I.A. Notes)

5 min.

23. At this time the instructor will present material on a potential response to a person who strongly objects to the use of positive reinforcement because "it is bribery." (Refer to I.A. Notes)

15 min.

24. The instructor will now pass out an exercise involving a potential problematic behavior. The participants will be asked to break into dyads. Each participant will get the chance to role play consultant (educator) and parent on specific problems.

15 min.

25. The instructor will now discuss the practicality of the following procedures for use in the home environment to decrease behavior: (Refer to I.A. Notes for details)
    1. Corporal punishment
    2. Response cost
    3. Time out

15 min.

26. After the above discussion of punishment procedures, the instructor will ask the participants to break up into triads to role play teaching a parent how to give his/her child a time out. The three persons in each group will switch roles of parent, teacher, and observer until all have played each role.

5 min.

27. When the role plays are all completed, the instructor will introduce the contingency contracting technique. A sample contract will be passed out for all participants to review. The following components of the contract will be highlighted by the instructor:
    1. Specify contingencies
    2. Specify mutual responsibilities
    3. Written form
    4. Signatures for all involved

5 min.

28. Since task analysis has proven to be an effective technique for teaching the severely handicapped many skills in the classroom, the instructor will suggest an instructional activity to be used with parents. (Refer to I.A. Notes)

5 min.

29. The instructor will now present the following feedback techniques that can be used in working with family members:
    1. Group discussions

2. Personal conferences
3. Phone conversations
4. Bug in the ear
5. Cuing lights
6. Coaching
7. Home observations
8. Tape recording

10 min.

30. The instructor will stress that all criticism should be sandwiched between positives whenever possible. For example, if a mother reinforces her child indiscriminately for both positive and negative behavior, the educator might say something like the following: "*Name,* you have such a nice way of showing Billy that you like what he does by hugging him. One suggestion that I have, though, is to only hug him when he has behaved correctly. I think that by showing him that you *really* like it when he is good, that this will add to your excellent relationship with him."

10 min.

31. At this time the instructor will pass out an exercise on constructive criticism. The participants will pair off and alternate consultant-parent roles in providing constructive criticism.
32. Following the constructive criticism exercise, the instructor will suggest programmed texts which have been designed to teach behavior management skills to family members. These may include but are not limited to the following:
Parents are Teachers by W. Becker
Living With Children by Patterson and Gullion
Families by Patterson

10 min.

33. The instructor should present material regarding considerations that need to be given in selecting initial behaviors for a cooperative effort between home and school. (Refer to I.A. Notes)

15 min.

34. As a final activity in social learning instruction, the instructor will present material on possible steps that can be taken by the educator to plan for maintenance and generalization of the family's new skills. (Refer to I.A. Notes) Following this presentation, input from the participants should be encouraged.

Community Resources

15 min.

35. The instructor will ask the participants to identify what community resources they feel would be of benefit to the families of their severely/profoundly handicapped students (e.g., educational, medical, residential, etc.). As the participants provide the types of resources, the trainer will record these on an overhead or the blackboard.

15 min.

36. After exhausting the participants' suggestions on community resources, the instructor will have the participants read and discuss the following article:
"Community Services Necessary to Program Effectively for Severely/Profoundly Handicapped," by Lawrence A. Larsen.

5 min.

37. The instructor will now ask the participants for any additions to the community resources list which may have evolved out of their reading and discussing the above article.

10 min. 38. At this time the participants will make two lists for their own use: One including the resources available in their home community and a second, including those needed services.

5 min. 39. The instructor will list several organizations that parents might choose to join. These include local, state, and national ARC's as well as other parent-professional organizations such as CEC, AAMD, and AAESPH.

10 min. 40. As a final activity in this section, the instructor will ask the participants for ideas regarding how best to disseminate community resource information to families. In addition ideas should be encouraged regarding how to inform the community that needed services are presently absent.

Legal Rights and Due Process

60 min. 41. The instructor will introduce a legal services representative who specializes in work with a mentally retarded population. In a question and answer format, this representative will discuss several issues including the following:

a. Guardianship
b. Right to vote
c. Conservatorship
d. Right to treatment
e. PL-94-142
f. Right to least restrictive environment
g. Status of current litigation
h. Child abuse

Paraprofessional Training

30 min. 42. The instructor will outline and discuss the groups of paraprofessionals available to the SPH teacher who needs classroom assistance. A university representative and coordinator of foster grandparent program may be brought in to briefly discuss the possible paraprofessional resources available.

45 min. 43. The instructor will elicit discussion from participants on the types of paraprofessionals involved in their classrooms and the pros and cons will be discussed; a brief lecture will then be presented on how to optimally utilize community volunteers who come to the class infrequently.

30 min. 44. The instructor will then discuss the critical role of the teaching associate, including the importance of giving the associate more than menial responsibilities.

30 min. 45. The instructor will describe briefly the technique of role playing demonstration and simulation as methods of training paraprofessionals. This discussion will be supplemented by having participants practice selected skills such as reinforcement technique on each other. Training techniques discussion should be fairly brief since much of this material should have been covered in the earlier section on parent training.

30 min. 46. The instructor will discuss the importance of providing corrective feedback immediately to the associate; this will be practiced in the

form of role playing, i.e., one associate, one child, and one teacher. The importance of applying reinforcement principals to shaping the associate's teaching skills must be emphasized.

15 min. Post-test

Suggested time for completion of module: approximately 18 hours.

Instructor Materials: Instructional Activity Notes

Use with Activity 1 - Introduction

a. Parents and other family members have a great deal of information about the severely handicapped child in your classroom. These persons have lived with this child all of his/her life and as a result have observed this child in a multitude of different situations. The educator should respect this experiential information that parents have and regard the family as an essential contributing discipline in the education of the severely handicapped individual.

b. With the increasing severity of the child's handicap, the more a "total" approach to his/her learning is required. Since the family has far more contact hours with their child than the classroom teacher, their assistance and cooperation is very important. In addition, families with a severely handicapped child may have more unique needs and demands placed on them. These families may require more supportive services from educators than the family of regular education children.

c. Parents and family members are in an excellent position to teach the severely handicapped person new behaviors. Many of the child's present behaviors were taught in the home. Since many critical areas of skill development are frequently called for in the home and community, it makes good sense to utilize those teachers that are most often present in those places - the parents and siblings.

d. Maintenance of skill development requires the periodic reinforcement of those new behaviors in places where the behavior is most likely to occur. Since so much of the curriculum emphasis with the severely handicapped is on functional instruction of skills appropriate for home or community use, it is essential that family members be involved in this aspect of their child's education.

e. In addition to teaching new skills and maintaining other accomplishments, family involvement is also necessary in the process of decreasing inappropriate behaviors. Since success in these efforts is often spelled "consistency," family cooperation is needed.

f. Finally, if all of the above reasons were not enough to convince one that family involvement is a good idea, legislative mandate has required such participation. According to PL94-142 parents must be involved in all placement decisions involving special education and also in IEP development.

g. (Refer back to Methodology for discussion questions)

Use with Activity 2 - Introduction

a. The phrase "parent training" means different things to many people. To some it is a neutral phrase, whereas for others it has negative connotations. One connotation of "parent training" is that someone (usually the professional) has information that is given to the parents. This suggests that the interchange between parents and professionals is a one-way street involving little if any reciprocal information giving. Another related connotation of this phrase is that the professional has knowledge while the parents don't.

b. Objections to the phrase "parent training" come from yet another area. These objections are based on the fact that "parent training" descriptor implies that just the parent or parents are to be involved. This position holds that the entire family should be included, rather than just the parents.

c. Preferred descriptors which better convey the purpose and goals of the relationship between the school and the home include "working with families" or "home-school-community education."

d. The trainer should now open up a group discussion on this topic:
   i. What does "parent training" mean to you?
   ii. Give an example of the potential harm that the label "parent training" might convey to someone.
   iii. What are some other program descriptors that better convey the idea of working in partnership with a family?

Use with Activity 3 - Introduction

a. In regard to the question about who should be viewed as the expert on the child, the trainer should stress the importance of the voluminous amount of information that is only available to the family on the basis of their interaction with the handicapped individual for 24 hours a day and 365 days a year. The family should be considered the primary authority on their handicapped member.

Use with Activity 4

Introductory Lecture to Communication Skills

We are now going to focus on some communication techniques, which when used effectively, will enable us to talk with teachers, parents, and groups more clearly. These skills are an asset to us in trying to relate to one another. By using good communication skills, we can prevent misunderstandings and potential problems.

a. Effective communication is hard to achieve. We tend to make a judgement, form an opinion, approve or disapprove a statement before we really understand what the other person is saying. The tendency of most people to react first by evaluating what has just been said from their own point of view, is a major barrier to interpersonal communication.

b. We can make progress toward better interpersonal communication if we try not to evaluate what was said. Instead, we should try to listen with understanding.

c. Listening with understanding means trying to see the ideas and attitudes of the other speaker from his/her point of view. It means putting yourself in the other person's place and sensing how it feels to be that other person with his/her thoughts, feelings, opinions, etc.

d. This may sound simple to do, but it is not.

e. The idea we are discussing was first stated by Carl Rogers in his book, *On Becoming a Person.* If you find yourself in a disagreement or if you are having problems communicating, Rogers suggests that you follow this procedure to test the quality of your understanding of what the person is saying. Stop the discussion for a moment and try to institute this rule: each person can speak for him/or herself only after s/he first restates the ideas and feelings of the previous speaker accurately and to the first speaker's satisfaction.

f. If you did this, it would mean that you understood the other person's thoughts and feelings so well that you could summarize them for him/her.

g. Using this procedure can improve your communication with others. If you use it during a

heated discussion or argument, you will find the emotion going out of your discussion and the differences being reduced. You will then be able to cope with the differences which remain in a very rational manner.

h. Summarizing or restating another's thoughts and ideas can be hard to do, particularly when you are involved in a heated discussion. When emotions are the strongest is the most difficult time to put yourself in the other person's place and understand what s/he is saying from his/her frame of reference.

i. In the following activities we will be developing and refining the skills which can allow us to better understand another person's frame of reference. These skills can be used by us in all of our communication experiences with others. We don't need to "save" them for troubled situations. By using the skills frequently, hopefully we will be able to prevent misunderstandings from occurring initially.

j. 30 min. After having asked if there are any questions or comments the instructor does the following: (Refer to Participant Materials.)
States that the participants will now have the chance to examine their own personal communication skills and determine which skills are used and which are not.
-The instructor hands out the Q-Sort board and envelopes and instructs the participants to read each statement on each square in the envelope. The participants are to place the square on the board where they think it best describes them.
-After the participants have completed this individually they discuss the placement of their squares with another participant with whom they feel comfortable.

k. 5 min. The instructor then states that the participants have had the opportunity to identify some skills which they use and don't use. The instructor states they are now going to look at four skills, which when used effectively, will make communication more effective. The instructor writes the four skills on a blackboard:
-Paraphrasing
-Description of feelings
-Behavioral descriptions
-Perception checks

l. 10 min. The instructor hands out the article, "Basic Skills for Discussing Interpersonal Relations" and instructs the participants to read the first page on paraphrasing.

m. 30 min. After having read the article, the instructor asks a participant to explain what paraphrasing is and asks how it can help or hinder communication. These points may be emphasized by the trainer:
- It helps communication by:
  i. clarifying issues
  ii. reducing emotion
  iii. reducing conflict
  iv. helping solve problems
- It hinders communication by:
  i. limiting interaction (if done too frequently)
  ii. inhibiting spontaneity
  iii. causing a person to forget the "train of thought"

n. 30 min. The instructor points out that it is the *quality* of the paraphrase and a person's

ability to know *how frequently* to paraphrase which will determine how effective this skill will be.

o. 15 min. The instructor next hands out statement and paraphrase cards and instructs the participants: (These are in Instructor's Materials)

i. - Some of the participants have cards with a statement on it. These cards have an"s" in the upper right hand corner.

ii. - Some of the participants have cards with a paraphrase of a statement on it. These cards have "p" in the upper right hand corner.

iii. - For a couple of minutes the participants circulate throughout the room to find the paraphrase for the statement or the statement for the paraphrase. The person should read the statement card first, then the other person reads the paraphrase. Decide if the paraphrase is appropriate for the statement. If it is, then the two participants should return to their chairs.

p. 10 min. The instructor states that the participants will observe a role play and will use the activity sheets which are handed out.

i. - The team of instructors acts out a role in which many paraphrases are used. (in Instructor's Materials)

ii. - The participants have an activity sheet on which they write the statements, paraphrases, and the effects on communication. (in Participant Materials)

q. 45 min. The next activity which the instructor introduces is one in which the participants role play some situations where they are consulting with parents. (Role play and observation forms are in Participant Materials. Instructor may choose which to use. 15 minutes per role play).

i. - The instructor has the participants divide into groups of three.

ii. - Each group will have two people who role play and one person who observes. Paraphrasing is to be used whenever appropriate and this is what the observer is looking for.

iii. - The observer will use an activity sheet to write down statements, paraphrases and the effects on communication.

iv. - After the first role play, the participants change roles and the observer takes part in the role play with someone else being the observer.

v. - Each participant will have the opportunity to be an observer and to participate in two role plays.

vi. - Following each role play, time is allotted to discuss what the observer noted.

r. 5 min. The instructor summarizes this activity by saying that there were a variety of activities designed to refine the paraphrasing skills because it is one of the most difficult to use effectively. It is a skill which improves only after a great deal of practice, so that is why it had so much emphasis.

s. 10 min. The instructor instructs the participants to read the sections on description of feelings and behavioral descriptions in the article, "Basic Skills for Discussing Interpersonal Relations."

t. 10 min. The instructor asks the participants for a definition or description of feelings and asks these questions:

i. Give me examples of these skills.

ii. In what situations would it be most appropriate to use this skill?

u. 15 min. The instructor asks the participants for a definition of behavioral descriptions and for an example. These questions might also be asked:
   i. How are descriptions of feelings and behavioral descriptions different?
   ii. When could you use a behavioral description?

v. 10 min. The instructor states that perception checks is the fourth communication skill to be emphasized in workshop. It is studied in more detail because it is more difficult to use and takes more practice in order to become competent using it.

w. 5 min. The participants are asked to read about perception checks in the article, "Basic Skills in Discussing Interpersonal Relationships."

x. 5 min. The instructor reviews what the definition is.

y. 10 min. A script is handed out to each participant to analyze for perception checks. They are to underline only the perception checks. (Participant Materials)

z. 10 min. The participants observe a role play by the trainers. The participants are given an activity sheet on which to record the perception checks and what effect they had on communication. (The role play is in Instructor's Materials; the Observation Form is in the Participant Materials)

aa. 30 min. The instructor discusses with the participants the perception checks they identified and the effects they had on communication.

bb. 30 min. Next the participants are asked to divide into four groups (1,2,3, and 4)

(15 min. for each role play, i.e., 10 to role play, 5 to discuss)

   i. Groups 1 and 2 will be given topics to discuss. They choose one. (The topics are in the Participant Materials)
   ii. Group 3 will observe Group 1. Group 4 will observe Group 2.
   iii. The observers will use an activity sheet and write what communication skills are used and how they affect communication. They will then discuss their observations with the group. (The Observation Form is in the Participant Materials)
   iv. The groups switch roles and Groups 3 and 4 are given a list of topics to discuss. They choose one topic. Groups 1 and 2 then observe and discuss their observations with their respective groups.

cc. 10 min. As a final activity, if needed, the instructors will be in a role play in which all the communication skills are used. The participants observe and record what skills were used and how they affected communication. (The role play is in the Instructor Materials; the Observation Forms are in the Participant Materials)

dd. 5 min. The instructor should summarize this part of the module by stating points emphasized in the Facilitator Notes.

Use with Activity 5

To Parent -*What are your expectations of the teacher's role in the education of your child?*

To Teacher - *What do you expect of the parents of children in your class?*

To Both - *What goals appear to be shared by both parents and teacher and where are there discrepancies?*

To Teacher - *Describe a positive experience that you have had recently with a parent. What specifically contributed to this experience?*

To Teacher - *Describe a negative experience that you have had with a parent. What contributed to this experience?*

To Parent - *Comment on what you think is critical to establish an effective parent/professional partnership. What events can occur which detract from a cooperative educational effort?*

Use with Activity 6 - Introduction

a. This activity is designed to highlight the potential areas of cooperative education between home and school. As is mentioned in the notes, MR and Child Development, Social Learning Applications, Community Resources, and Legal Information represent the key components.

b. With regard to the time frame for each of the components, a longitudinal rather than a time restricted approach is favored. An acceptable arrangement might be to conduct a series of meetings on a particular topic area and then to conduct follow-up meetings at later times. These follow-ups might be conducted individually or in groups. Another follow-up strategy might be to arrange for guest speakers to meet with the parent group on occasion. The idea is that we need to get away from the intensive training method and build in alternatives which involve the home and school in the continuing education of the handicapped individual. The time needs discussion refers to the desirability of developing a continuing relationship between home and school rather than an approach which calls for a six week behavior mod course with no follow-up. As an illustration the following example is provided:

Component	Why	Time
MR and Child Development	Knowledge of child development should assist families to better appreciate the sequence of development. If the developmental sequence is emphasized rather than the rate of development, families might be helped to set reasonable expectations.	A series of weekly child development classes should be followed by a regularly scheduled special topic presentation on development every two months or so. In addition, parents who have received the core sequence might take active teaching roles with parents new to the program. This provides an ongoing program with active parental participation.

Use with Activity 7

Instructor Notes - Whatever your purpose in organizing a group of people, similar skills are called upon. For instance you have to arrange that they actually convene together. Once they meet together, it is desirable that they participate and become involved in the group. If the group is ongoing it is important that these persons come back for future meetings. And finally, it is important that the group's purpose will continue to be met when the meetings are occurring less frequently.

In summary the group organzier must attend to the following component steps:

1. Arrange that people meet together.
2. Encourage active participation.
3. Encourage people to return for future meetings.
4. Plan for maintenance of group effort when meetings are less frequent.

All of the above component steps will be expanded upon in the subsequent section.

Use with Activity 8 - Organizing Families Into Groups

a. The following are seen as advantages of working with a group size of approximately 5 to 15 individuals as compared with reliance on individual consultation.
   i. Economical - Better use of professionals' time.
   ii. Provides the participants with a variety of peer models.
   iii. Group reinforcement properties.
   iv. Potential of group to develop self-help function. That is, the parents may begin consulting with each other on common problems and offering each other assistance.

b. After delineating the above advantages, the trainer should ask the participants for any additional advantages as well as potential disadvantages. A few potential disadvantages of a group oriented approach are the following:
   i. Certain persons may be intimidated by a group and thus avoid becoming involved.
   ii. Certain family situations involve very unique and personalized problems which are not amenable to general group instruction.
   iii. A group approach may detract from the precise program development which unique family situations might require.

More individualized approaches might take advantage of the contingency constructing technique with specific responsibilities for all parties laid out well in advance. This method can allow for the precise description of a particular change procedure, monitoring plan, and program consultation component.

Use with Activity 9 - Group Organization

As the participants are looking over the section in the article, the trainer will present the following key concepts that are involved:

i. Involve parents in the planning. Individual interviews may be helpful to stimulate support for the program. Parents' input regarding the content and format of the meetings should increase their commitment. We are all more likely to support a program with which we've had some input than one which is imposed upon us.
ii. Personal invitations to potential participants. Rather than send a form letter to the parents, it is more advantageous to invite them through a personal visit or phone call. It may even be possible to have the parents invite each other.
iii. Transportation assistance should be provided as needed.
iv. The location and time should be based on the convenience of the participants rather than the professional.
v. Babysitting should be provided.
vi. Reinforcers contingent on attendance and participation could be utilized.

Use with Activity 10 - Group Organization

a. The following represent a variety of reinforcers which educators might utilize to encourage support and cooperation in the operation of family education programs.
   i. Social praise
   ii. Recognition
   iii. Certificate of achievement (e.g., course credit)
   iv. Money (e.g., monetary refund)
   v. Free babysitting
   vi. Extra child services
   vii. Phone calls of encouragement

b. After pointing out the above potential incentives, the trainer should have the group discuss the issue. (Refer back to Methodology).

Use with Activity 11 - Group Organization

a. The following techniques have proven useful for increasing group cohesion:
   i. Interesting group format. A variety of books, speakers, and audiovisual presentations might be useful. Any activities which encourage active participation should enhance group cohesion (e.g., role plays, member presentations, etc.).
   ii. Techniques to increase member-member interactions (e.g., dyad activities, reinforcement, etc.).
   iii. Buddy system - Assign members to dyads who must communicate between formal meetings. This technique may prove useful for fostering friendships which will contribute to the attractiveness of the meetings.
   iv. Reinforcers for attendance, punctuality, and productivity at meetings. We all like to do that which results in nice things for us. By utilizing incentives we insure that the group will become a place where the participants can expect to be reinforced.
   v. Involve the participants in planning and leadership functions as the group progresses.
   vi. Establish a norm of member-member positive feedback.

b. An additional advantage of utilizing techniques to increase the cohesiveness of the present group is that much groundwork will have been laid for a longitudinal cooperative approach that will be of much benefit in the continuing educational progress of the handicapped individual.

Use with Activity 13

Unique approaches are applicable with special families. For instance minority families may be more motivated if the professional is of the same minority. This may result in an educator seeking a co-leader, drawing upon the expertise of another parent within the group, or seeking assistance from another community member.

Single parent families may require an approach which recognizes the uniqueness of their situation. This approach may include support services such as babysitting and incentives for involvement such as social events. Program objectives for these families should respect the difficulty of raising a family with only one parent.

Mentally retarded parents suggest that the professional sequence program objectives in an incremental fashion so as to gradually build in competencies. These families may require constant monitoring and encouragement for their adherance to a program.

With a family that refuses any involvement with the school, the professional may attempt the following courses of action:

1) Approach the family by asking if there is anything you can do for them,
2) Change a behavior in the child which the family will accept as a definite improvement, and
3) Offer extra child services contingent on parent involvement.

In families where only one parent chooses to become involved contingency contracts have been developed which specifically call for the participation of both parents. Some programs have made program involvement, fee reductions, or extra services contingent on the participation of *both* parents.

Use with Activity 14 - Assessment

a. Far too often the professionals' assessment is a problem oriented one, in which the concentration is on weaknesses rather than strengths.

b. Although there may be definite weaknesses in the family interaction system that are not benefitting their severely handicapped member, chances of affecting change are probably enhanced by building on existing family strengths.

c. By emphasizing the strengths, the family's receptivity to a cooperative arrangement between school and home should be increased. Out of this cooperation can come the foundation on which to build in changes of benefit to the severely handicapped member of the family.

d. In addition to the strengths of the family as a whole, it is important to assess the handicapped member's strengths also. That is, what does this person do particularly well at home, what activities does s/he enjoy, what does s/he do with free time, etc. This provides the professional with some knowledge about the child's competencies as well as about potential incentives for programs.

e. By focusing the family assessment on the positive aspects, we accumulate a great deal of useful program material as well as build a strong foundation for continuing work with a family.

Activity 15

Weaknesses could be added as potentially helpful program information as long as the emphasis is on the family strengths rather than weaknesses.

Activity 16

All of the assessment techniques presented are methods of acquiring information. As information is acquired by any of the techniques, this should contribute to a working relationship between home and school.

It must be kept in mind that strictly verbal and/or written reports are known for their unreliability. Direct observation is a more reliable and valid assessment technique which provides actual performance information.

Techniques which stress actual observation assessments are to be preferred over pencil-paper and verbal reports. Usually a combination of a variety of assessments is helpful.

a. A personal interview is one technique for establishing good rapport as well as acquiring information.
b. Telephone communication is another way of learning more about the family interaction patterns.
c. Parent self report via personal inquiries and/or questionnaires is yet another assessment technique.

d. Written tests of the parents' knowledge in certain areas has been utilized, but is discouraged due to the negative associations that such tests have for many people.

e. Direct observation of the family members interacting with their handicapped member at the school is one very direct assessment technique. These observations can be prescribed learning situations, free play situations, or simply a naturalistic observation of interaction patterns.

f. Direct observation in the home of the family interaction patterns should also be quite useful. The dimension of realism that actually observing at home can reach cannot be approached by other less direct assessments (e.g., personal interview).

g. Both audio and/or videotaping could be utilized at school and home as a means of conducting assessment.

Use with Activity 17 - Social Learning

Social learning instruction refers to the fact that most of what we do is influenced by things which happen around us. For instance we tend to do more of those things which result in pleasant events or which turn off unpleasant events. On the other hand we do less of those things which result in no benefit or which are followed by unpleasant or aversive events. (Participants should be referred to appropriate sections of systematic instruction and behavior management modules)

a. *Behavior specificity* skills are prerequisite to the implementation of cooperative programming between school and home. That is, unless we are able to define the behaviors of interest in observable specific terms, our program efforts are doomed to failure.

b. After we have defined the behaviors of interest, we must stress the contextual nature of behavior. The contextual nature of behavior refers to the fact that a given behavior occurs following certain antecedent events and is followed by consequent events. The *an*tecedent, *be*havioral and *con*sequent events are sometimes referred to as the *ABC's of behavior.*

c. Prior to implementing a behavior change program, an accurate assessment of the target behavior is needed. This assessment is referred to as *Baseline.* The following are reasons why this is seen as an important component of a home initiated program:
   i. A baseline provides information about the actual state of events. Sometimes one's subjective impression of a situation may underestimate or overestimate the true state of affairs.
   ii. A baseline provides a family with a measure with which to compare the results of a program. After a behavior is changed it is sometimes hard to remember what the situation was like before the program.
   iii. A baseline provides information for both educators and families to evaluate whether or not a program is working.

d. *Recording* of behavior observations on charts and/or graphs is a skill which is necessary if we want to collect baseline information and conduct ongoing assessment. For use with family members, we need to develop charts which are simple to use and don't require a great deal of time.

e. Since a positive approach to behavior change is the method most often favored, families will need skills in the *selection of reinforcers* and in the contingent *use of reinforcers to increase behaviors.*

f. Sometimes *procedures to decrease behavior* are needed in conjunction with positive reinforcers. The pros and cons of the following techniques to decrease behavior should be covered: corporal punishment, time out, and response cost.

g. *Contingency contracting skills* are needed by educators in working with parents and are also skills that families could use with each other. For example, the two parents may contract with each other to perform certain functions in relation to their handicapped child. Such a reciprocal arrangement may benefit the handicapped family member through more parental attention to his/her skill development.

h. *Transfer of change techniques* should be emphasized as reasons family involvement is so important to the education of the severely handicapped individual. That is, for new skills to be acquired, generalized, and maintained it is important to reinforce these new behaviors at different times, by different persons, and in different places. Parents and other family members are in an excellent position to promote the skill development of their handicapped family member in places and times outside of school.

i. *Since task analysis* has proven an effective strategy for teaching the severely handicapped many functional behaviors, it makes good sense to teach family members how to utilize this technique to promote skill development. This strategy emphasizes the importance of building competencies step by step so as to maximize a successful learning experience.

Activity 20 - Instructions for Exercise

With each of the following situations, define the target behavior of interest in behavioral terms. The definition of the target behavior should be specific enough so that another person could independently observe the behavior reliably. Attempt to make every situation one in which you are attempting to increase a behavior rather than merely suppress an undesirable one.

After identifying a target behavior and developing a behaviorally specific definition, discuss potential assessment and intervention procedures that could be utilized. Participants should utilize information obtained in the behavior management module.

Each participant should read the situation carefully. One of the participants will act as consultant and the other as parent in order to develop an operational definition of the target behavior. Use the information provided as factual and expand as you interpret the situation. When the target behavior has been defined, switch roles and proceed to identify appropriate assessment and treatment procedures.

Example for Trainer: Situation II

Target Behavior - Successful milk drinking

Operational Definition - Jane will sit down for an entire meal with the family and demonstrate successful milk drinking by not spilling milk from her glass, others' glasses, or the milk pitcher. Milk spillage will be defined as an action which causes milk from glass, pitcher, or mouth to drop on table, self, or floor.

Assessment - Frequency count of milk spills per meal.

Intervention - Social praise and a dessert treat for each total meal in which no spillage occurred.

Activity 21

Each graph or chart should attempt to include the following features:

1. Simplicity -
   Behavior to be charted should be discrete so that an occurence is easily detectable. Either the frequency of the behavior or the time for observation should be arranged.

2. Practicality -
   The time unit for recording should be limited enough so that the family can easily record the behavior. It might help to specify short time periods for recording (e.g., record only during the lunch meal).
3. Utility -
   The recording device could provide a graphic respresentation of the effect of the program so that behavior changes are readily apparent.
4. Accountability -
   There should be a built in monitoring system with the charts which allows for periodic assessments of the recording.

Use with Activity 22 - Social Reinforcers

a. One exercise that has proven useful for teaching families some of the principles behind positive reinforcement has been that of building a reinforcement hierarchy. For purposes of demonstration, the participants should take the roles of the parents.

b. The trainer will now ask the group questions such as the following:

   - What types of events does your child really like?
   - What type of thing will s/he work for?
   - What activities does s/he like to do?
   - What kinds of foods does s/he really enjoy?

c. As the participants provide specific examples the trainer will write these on the blackboard in different clusters. Each cluster will correspond to a grouping of reinforcers on the reinforcement hierarchy, ranging from a primary edible cluster to a more instrinsic self reinforcement category. The other categories which might be included are tangible material reinforcers (e.g., toys, radio, record, etc.), activity reinforcers (e.g., trip to a park, ride in a car, etc.), token reinforcers (e.g., money, poker chips, stars, etc.) and social reinforcers (e.g., pat on the back, hug, kiss, etc.).

d. When all of the categories have several examples in them, the trainer can use this listing as a way of expressing the uniqueness of each person and the necessity of individualizing reinforcers. It should be stressed that an item is only a reinforcer if it works, that is, if it increases the behavior which immediately preceded its presentation.

e. The reinforcement hierarchy can also be utilized to illustrate the desirability of pairing reinforcers.

Use with Activity 23 - Social Learning

a. If someone raises the bribery issue, there are several responses which one can use. We might be able to conceive of a response hierarchy in which we only proceed with our explanation to the point that the adversary has objections.

b. For instance we might initially explain that we all work for different things (e.g., "We go to work and receive a paycheck. Few of us would continue to work if our paycheck stopped").

c. One might continue by explaining that all tangible reinforcers are accompanied by social praise. Eventually just an occasional pat on the back may be all that is necessary.

d. If the above is not sufficient, you might explain that according to Webster, bribery only refers to payment for illicit or deviant actions. With reinforcement we are talking about payoffs for appropriate desired behavior.

e. Still another response might stress that research has shown that reinforcement works. That is by the use of contingent reinforcement children have learned several new behaviors and their families have seen great improvements at home.

Use with Activity 25

a. There are generally two types of punishers. One relies on administering some aversive event such as a spanking. The other type relies on the taking away of privileges.

b. Corporal punishment is usually associated with spanking. Although spankings are common in many families, the reliance on this mode of punishment should not be encouraged. If a family insists on using spankings for punishment, attempt to encourage them to follow the guidelines below: (Becker, 1971)

i. Give immediately and specify the reason.
ii. Use a warning signal.
iii. Carry out in a calm manner.
iv. Always reinforce behaviors incompatible with punished behavior.
v. Be consistent!

c. Punishment procedures which rely on taking away positives are preferred in that they usually prevent the development of the intense emotional responses that corporal punishment stimulates. Two techniques which rely on taking away positives are response cost and time out. Response cost is the loss of earned reinforcers (e.g., loss of allowance) or potentially earned reinforcers contingent on a certain inappropriate behavior. Time out is a contingent withdrawal of access to reinforcement for a certain period of time.

d. Since time out (T.O.) is a commonly used punishment procedure in this home, guidelines are necessary to assist the family in appropriately using this technique. The following steps should be followed when giving a time out:

i. Give immediately for behaviors clearly disruptive or damaging.
ii. Always reinforce behaviors incompatible with the disruptive or damaging behaviors.
iii. Give time out instructions in clear, matter of fact tone of voice, specifying the contingency.
iv. T.O. location is to be void of all potential sources of reinforcement.
v. Escort child to time out with as little attention as possible.
vi. T.O. should last less than 3 minutes after the child has quieted down.
vii. Use T.O. consistently.
viii. After time out return child to ongoing activities and insure that s/he has the opportunity to be reinforced for behaving correctly.

Activity 26

Facilitator notes for Time Out Exercise. Assume in all cases that the behavior to be consequated by time out is hitting. The steps listed in Activity 25d for T.O. should be followed with the following suggested additions:

1. Develop an operational definition of the troublesome behavior.

2. Record the frequency of behavior.

3. Example instruction for contingency - "John, for getting along well with your brother and sister you earn the privilege of playing with all of us. Remember, any hitting gets a T.O. So, no hitting and you earn the right to stay and play."

4. When hitting occurs, provide a brief explanation and then carry out the procedure. For example, "John, you hit Sarah. You have to take a T.O." With as little physical contact as possible but as much as necessary see that the child goes to the T.O. area. There should be no further verbal interventions with the child as s/he goes to the T.O.

5. Remember, the most important points are that the ongoing activities must be reinforcing, the T.O. area must be void of potential reinforcers, and the contingency must be administered consistently and fairly.

The observer will follow Activity 25d and 26 to check which items the teacher includes in the T.O. explanation. Feedback should begin with observer telling what items were successfully included and then indicating what points could also have been mentioned.

Activity 27

The instructor will present contingency contracting information to participants by initially passing out a sample contract to all participants. Contingency contracting is defined as an agreement between two or more persons regarding the program procedures to be followed. The following components should be included in the contract:

1. Precise statement of the behaviors, responsibilities, or accomplishments which will be attained prior to reinforcement.

2. Specify mutual responsibilities of all involved. This includes what the target individual must do to attain the reinforcers and also what significant other persons (e.g., parents, teachers, siblings, etc.) must do in relation to the program.

3. Clear statement of the reinforcers for attaining objectives.

4. If at all possible, the contract should be stated positively. This can be accomplished by targeting on behaviors to increase (e.g., correct spoon usage) rather than on behaviors to decrease (e.g., spoon feeding).

5. The contract should be arranged through mutual negotiation and not imposed by the adult in charge. To the extent possible, the student should be actively involved in developing the program.

6. The contract should include an objective record of the program's results.

7. The contract should be in written form. Verbal agreements are easier forgotten than written. The permanent product of a written agreement facilitates program consistency.

8. All those included in contract should sign their names to indicate agreement with the terms.

The example contract illustrates the critical components listed above. At this time the trainer should discuss the utility of this technique for the classroom teacher. Possible discussion questions are as follows:

In what program areas do you see contingency contracting of potential use to you?

What type of reaction would you possibly receive from families if you suggested using this technique?

What advantages do you see in using contingency contracts?

What disadvantages do you see?

What has been your experience in using contracting?

Use with Activity 28 - Social Learning

One strategy for instruction of task analysis is to have the group observe a particular behavior chain (e.g., handwashing, cleaning a floor, playing records, etc.).

For presentation to the participants this activity should take no more than the five minutes indicated. If a demonstration is included, the time should be expanded to approximately 15 minutes. As an example the trainer can slowly model wash his/her hands (e.g., turn on water, wet hands, pick up soap, soap palms, put soap down, soap back of hands, rinse hands, turn off water, pick up towel, and dry hands). While modeling these steps the participants will be asked to write down the component steps. After completing the sequence, the trainer can discuss the various step breakdowns possible in such a task analysis.

A brief forward or backward chaining demonstration of how to use task analysis in programming could follow (refer to systematic instruction module). It should be emphasized that a variety of skill breakdowns may be generated. The important concept is that task analysis provides a key for incrementally developing more complex behavioral repertoires via systematic step gains.

Activity 29

Feedback is a vital component in the learning process. In conducting behavior management instruction with families it is important that they receive reinforcement for the things they are doing correctly and constructive criticism for those behaviors which are not beneficial to their child's development. There are a variety of channels that can be employed to provide family members with differential feedback. Examples of various techniques are as follows:

1. *Group discussions* - In a group discussion the trainer may want to accentuate the positive (e.g., "I was pleased to see the gains that Luch has made on her spoon feeding. It really shows that you've been working with her and doing an excellent job.")

2. *Personal conferences* - In personal conferences the feedback can become more specific to the individual family. This enables the teacher to praise specific accomplishments as well as offer suggestions for different ways of handling situations. Personal conferences assist in building a working relationship between home and school.

3. *Phone conversations* - This channel can be used by the teacher as a periodic program booster or by the family as a consultation method (e.g., "Charlie just started biting himself again. What should I do?"). Advantages of the phone communication are that they can be made more frequently than face to fact interactions and that they can occur immediately after a problematic event.

4. *Bug in the ear* - This technique is utilized in laboratory settings. The parent is given an ear phone so that the trainers may communicate directly via a transmitter from a distance removed from the parent-child interaction. For example, the trainer may observe the parent from behind a one-way mirror and provide the parent with immediate feedback regarding the interactions. An advantage of this technique is that it allows for immediate feedback during a real parent-child interaction while a disadvantage is that a laboratory setting is usually involved.

5. *Cuing lights* - These are used in much the same manner as the bug in the ear technique. For example a green light might mean praise the child while a red light means ignore.

6. *Coaching* - In coaching the teacher may directly observe the parent-child interaction and provide verbal guidance regarding what to do. This technique can be utilized in any setting. Its advantage lies in the immediacy of feedback for the actual parent-child interaction.

7. *Home observations* - This technique is advantageous in that it is conducted in the child's most frequently encountered environment, the home.

8. *Tape recording* - When you cannot actually be present in a home, you might have a family tape record particularly crucial interactions (e.g., mealtime). By reviewing an actual tape recording, both the teacher and the parents have a somewhat objective basis on which to discuss the family interactions.

In summary, the best techniques are those which provide immediate feedback for realistic interactions. Thus these techniques which allow for observations and feedback in the home are to be preferred over those which rely on discussions removed from both the child and the natural setting. Of course time constraints often dictate a less than ideal arrangement in providing feedback to families.

Activity 31 - Examples of possible answers are as follows:

Case 1 "Mrs. Jones, could you come over here for a moment? I was wanting to thank you for bringing in these supplies. This will really help us out. Also, I forgot to mention when you came in that Jimmy is alone because he's been hitting the other students. He can come out with the others in one minute, but until then we shouldn't pay any attention to him. Maybe we can show the other children all the nice things you just brought in."

Case 2 "Mr. and Mrs. Smith, I'm so pleased that you are able to consistently attend these meetings. It really shows how interested you are in Bob's school program.

"One thing we still need to work on is Bob's toothbrushing before school. Since you both have expressed interest in working on this program with Bob, I feel that a written agreement would help us all achieve the consistency that is necessary. I'd like us to develop a contingency contract." (The following paragraph need not follow immediately after bring up the contract. You may, however, want to conclude with something along this line).

"Bob is so lucky to have parents who care about his progress. As a teacher it is a real pleasure to work with such a supportive family."

Case 3 "Mr. Peterson, I'm pleased that you come and observe Sarah. You are the only father who comes regularly to see his child.

"However, I feel that we should be proud of the progress that Sarah has made on learning to print her name. It doesn't matter that it's taken her six weeks to learn to trace her name. What is important is that she has made improvements.

"Your interest and support of Sarah in her programs are important. Next time you come to class I'll tell you where she's made improvements so you can cheer her on. She's so happy when you come to see her."

Activity 32 - Full references of parent texts:

Becker, W.C. Parents Are Teachers. Champaign: Research Press, 1971.

Deibert, A.W. and Harmon, A.J. New Tools for Changing Behavior. Champaign: Research Press, 1970.

Hall, R.V. Managing Behavior: Behavior Modification Applications in School and Home. Kansas City: H & H Enterprises, 1971.

Patterson, G.R. Families. Champaign: Research Press, 1975.

Patterson, G.R. and Gullion, M.E. Living with Children. Champaign: Research Press, 1968. (New Revision 1977)

Use with Activity 33 - Social Reinforcers

a. The initial behavior selected for a collaborative working relationship should be a relatively easy behavior to change. Success breeds success and to begin with a positive experience builds a foundation on which to work together in more complex situations.

b. The behavior selected should be of interest to the family so that they will perceive the change as being significant.

c. The initial effort should be to increase a behavior. This should establish a positive approach that can contribute to a long term cooperative approach between home and school.

Use with Activity 34 - Social Learning

a. The educator may make periodic visits and phone calls in order to praise successes and to troubleshoot any difficulties.

b. The educator may teach the family self maintaining skills so that they might keep track of their own program.

c. Reciprocal arrangements among family members may be made so that they might pay each other off for following through on a program.

d. Develop a buddy system among the families so that a self help system might evolve. By calling on assistance from their peers, the families might prevent problems by using helpful information from one another.

e. Follow-up training sessions or booster sessions might be utilized to review the material, share successes, and troubleshoot problems.

f. Involve veteran families in the training of new families. This may assist the veteran families in maintaining their skills as well as encourage new families to become involved.

g. Increased school-home communication is consistent with maintaining program skills. Progress notes between school and home are one method of increasing communication. Still another method is to utilize tape recorded daily activity messages that can be available to the families via an answering service.

h. A parent resource library could be established and maintained by parents for their own use. This library could include numerous program examples from which the families could draw.

i. Family members could learn coping statements that they could use with themselves to assist them through particularly rough times.

Activity 36 - Discussion
Questions for Articles

Larsen, 1977:

What are the arguments in favor of continued support of institutions for the severely/profoundly handicapped?

What three interrelated priorities are involved in deinstitutionalization?

What specific community services are critical to retaining and serving the severely and profoundly handicapped in community settings?

Instructor's Notes
Activity 40 - Potential Means
of Disseminating Information.

Community resource information to families:
Newsletters
Directory of services
Special presentations (e.g., medical, recreational, residential, etc.)
Conferences
Parent organizations (local ARC)

Possible ways of informing community of needed services:
Parent organizations (ARC)
Active involvement in city government
Community service projects (e.g., fund-raising events for services)
Newspaper publicity (letters to editor, feature articles,
program coverage, etc.)
Litigation

Use with Activity 42

The following paraprofessionals are available to classroom teachers in educational programming. A brief discussion of these resources will center around identifying sources of paraprofessional assistance.

Teaching associates - (this is discussed below)
Foster grandparents - the foster grandparent program is supported by federal funds and allows different people from the community to help in classrooms for the severely/profoundly handicapped;
Four-year college students - student teachers, interns, and practicum students can receive on-site training in SPH classrooms as well as provide extra "hands" to help out; also eases the way in for university professionals to become involved in programming;
Junior college students - provides a good training site for teacher associates, eventual professionals in the field, as well as extra "hands" in the class;
ARC, Vista, Red Cross Volunteers - these agencies can provide a direct pipeline to sources which can help out in the classroom.

Use with Activity 43

a. Paraprofessionals can provide the greatest amount of assistance if they are on-site regularly. The greatest advantage of paraprofessionals is that they provide:
   i. extra help in the classroom;
   ii. new ideas or allow the teacher flexibility with new program sequences or methods;
   iii. more public visibility for the classes;
   iv. an impetus for staff mode to improve since staff can see their development.

b. There are some liabilities to use of paraprofessionals which include:
   i. they do not always show up when scheduled;
   ii. they are frequently able to come only periodically and not enough to really help program follow through;
   iii. they are inconsistent with programs;

iv. they are, at times, immature or exhibit inappropriate temperament;
v. they may be excessively overprotective or have a faulty set of expectations.

c. There are at least three means of utilizing paraprofessionals who can come only periodically;
   i. refusal to let them become involved in important programs;
   ii. insist that the university or participating agency provide enough extra hands so that the classroom program does not suffer and can instead plan on a third or fourth set of hands in the class;
   iii. paraprofessionals can be used in a menial way, i.e., for the purpose of changing diapers, pushing wheelchairs, etc.; it may be in isolated cases that this is the only involvement that the paraprofessional desires.

Use in Activity 44

a. The role of the teaching associate becomes increasingly important with the severity of the handicap exhibited by the child. A low staff-to-child ratio of instruction will facilitate a) individualized instruction and b) homogeneous grouping by functioning level of children.

b. If the teaching associate is directly involved in assessment, intervention, program evaluation, development of materials, etc., s/he is more likely to perform more capably, contribute to program development, and in general help the program more smoothly.

c. When the associate is allowed to perform only menial activities, it suggests that s/he is not capable of doing any more. This is not true as has been indicated repeatedly in behavior modification programs in institutions. An example of this is outlined in the Kansas Program for Teaching Associates described below.

Use in Activity 45

a. *Role-playing* - one participant plays the student and the other is the associate or teacher; a target skill is identified by the instructor (i.e., rapid toilet training) and then the skill is practiced.

b. *Demonstration* - the instructor demonstrates how a given skill might be taught to an associate with a limited educational background; for example, in teaching how to train motor limitation, it might be explained as "the need for teaching the child to be a copycat".

c. *Reinforcement simulations* - the instructor would teach the associate how to reinforce appropriately by setting up (hypothetical) target situations in which the child should be reinforced; the associate could practice principles such as immediacy and expressiveness of reinforcement.

Use in Activity 46

Corrective feedback is extremely important in shaping the behavior of the associate for several reasons. They are:

- more likely to make mistakes than professionals
- more likely to repeat the same mistakes
- less likely to ask for assistance
- more likely to be disinterested in the job
- less likely to be well paid and thus need social reinforcers

Corrective feedback entails the professional frequently (four to eight times a day minimum initially) saying "Good job of doing it this way . . .' or "That's good, but why not try this also . . ."

This lets the associate know that the teacher is interested in his or her development. It will also help the associate set professional goals to work on thus facilitating evaluation of annual job performance.

Instructor Materials: Worksheets

Paraphrasing Game Use in Activity No. 4

These should be typed on 3 x 5 cards. On each card is either a statement with "s" in the upper right corner or a paraphrase with a "p" in the upper right corner.

Statement:
I think the movie Jaws was terrible.

Paraphrase:
Terrible? You mean the acting was poor?

Statement:
I had a great time at the benefit-ball last night.

Paraphrase:
You mean you really like to dance?

Statement:
Jimmy Carter is unfit to be president.

Paraphrase:
Do you think that he's too right-winged?

Statement:
I think the American Eagle is a terrible symbol.

Paraphrase:
Do you mean that birds don't properly reflect the best image of our country?

Statement:
I fixed the best spaghetti last night.

Paraphrase:
It sounds like you really enjoy cooking.

Statement:
The garbage collectors in our neighborhood are awful.

Paraphrase:
You mean they forget to pick up the trash?

Statement:
Burt Reynolds has some fine characteristics.

Paraphrase:
Do you mean he has a great body?

Statement:
John would make a fine secretary.

Paraphrase:
You think he is a good typist?

Statement:
The tax collectors are after my uncle this year.

Paraphrase:
Do you mean he was dishonest about what he claimed for earnings?

Statement:
Putting a lot of salt on your food isn't always good for you.

Paraphrase:
Do you mean it can cause illness?

Statement:
The discount store is having a big sale.

Paraphrase:
It sounds like you intend to save a lot of money.

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Script 1: Paraphrasing Role Play - Analyzed

Consultant 1: Hello, *(Name)* I came to talk to you about being the co-facilitator for the Follow-up and Facilitator's Workshops to be held in Napsi, Missouri next fall. We expect it to be a fairly small group of people and many of the materials are already duplicated.

Consultant 2: *(Name) , when you say the fall, do you mean September and October?* What exactly are the dates? I would be very interested in co-facilitating if the dates don't conflict with other commitments.

Consultant 1: The dates for the Follow-up are August 24 and 25, and the dates for the Facilitator's Workshop will be October 5, 6, and 7. As I understand, these workshops should be scheduled about five or six weeks apart so people have a chance to practice the skills taught in the Informal Diagnosis/Prescriptive Programming Workshop.

Consultant 2: Concerning those exact dates, I would be available. *You said the workshops need to be scheduled five or six weeks,* which is the case with the Informal Diagnosis/Prescriptive Programming Workshop and the Follow-up, but not necessarily the two workshops we're talking about. Nevertheless, the dates are O.K. *Earlier you stated it would be a fairly small group of participants,* tell me more about the group, that is their positions, training, the exact number, etc.

Consultant 1: The group will consist of 12 people in a variety of special areas who have not been involved in many workshops, although they did participate in the five-day Informal Diagnosis/Prescriptive Programming Workshop: They were a very enthusiastic and cooperative group.

Consultant 2: *When you say they represent a variety of special areas,* what positions are you referring to? Tell me specifically what they do, because it will help me understand the group better and help me plan materials that are more pertinent to their needs.

Consultant 1: They represent learning disabilities, behavior disorders, the visually impaired, hearing impaired, speech and language disorders, the mentally retarded and the gifted and talented. There is also one school administrator and one school psychologist. Ten participants are in elementary buildings and two are in secondary. Does that give you a more accurate description?

Consultant 2: Yes, thank you, *(Name).* Now, in terms of relating the material to IEP's, was this done at the ID/PP workshop frequently?

Consultant 1: *Do you mean individualized education program plans when you refer to IEP's?*

Consultant 2: Yes, that's right.

Consultant 1: There were samples of forms shown at the ID/PP workshop, but that's all I remember.

Consultant 2: I need to know if the components of the IEP have been outlined and shown how the modules in the ID/PP workshop relate to the writing of IEP's. So many people are concerned about these that I thought we might tie it into the Follow-up. What do you think?

Consultant 1: *Are you saying the components of the IEP should be listed and compared to those in the ID/PP workshop?*

Consultant 2: Yes, exactly.

Consultant 1: That's a good idea. The more exposure these people get, the better. Do you need to see

the list of materials now or can I send it to you?

Consultant 2: If you'll send it to me that would be fine. What are some commonly used tests in your district? I need to know these to make decisions about what subtests to use.

Consultant 1: Most commonly used are the Gates-McGinite, the I.C.R.T., that is the Individualized Criterion Reference Testing Program, and the Stanford.

Consultant 2: I'm not familiar with the I.C.R.T. Tell me more about its features.

Consultant 1: The ICRT is a program used in the secondary MR programs and has subtests in reading and math. It's given individually and is used extensively as a pre and post-testing instrument.

Consultant 2: I see. *So it's a diagnostic test used with students in Jr. High and High School for both reading and math?*

Consultant 1: Yes, You're correct, *(Name).* I'll send you copies of several subtests so you're familiar with it and can use it in the Follow-up if you wish.

Consultant 2: Fine. So as I understand, *you offered to send me the list of materials and subtests of the ICRT.* I think that is sufficient information for me now.

Consultant 1: O.K. *(Name).* Glad you can assist us. I'll keep in touch concerning other organizational details.

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Script II: Perception Checks (Analyzed Version) Key

Resource Teacher: RT
Classroom Teacher: CT

CT:	Say, Cathy, I need to talk to you about Tammy. I'm just having a terrible time with her. I just can't get her to do anything in my classroom. She won't complete her math, she bothers others all the time, she can't read anything, I just don't know what to do.	
RT:	*I get the impression that you're feeling pretty frustrated with the situation.* Is that right?	PC
CT:	Exactly. I have 21 other kids in my class to worry about and I just can't tolerate Tammy's constant nagging and immaturity.	
RT:	*It sounds, too, like you're feeling confused about how to handle her behavior and her academic problems?*	PC
CT:	Yes, I think the hardest thing for me to do is plan what she should be doing academically. She's so far behind the others that I can't place her in any reading or math group, and I know then that she just doesn't know what to do with her time.	
RT:	*Do you feel as though Miss Schlampp could be helpful to you in helping to locate materials?*	PC
CT:	Yes, but I just don't have the time to run up to the IMC every day and plan for an hour with Miss Schlampp what I'll do with Tammy. That's not fair to the other kids.	
RT:	*So, my impression is that you're confused about what materials to use, you're frustrated with Tammy's behavior, and feel as though the time commitment is unreasonable.*	PC
CT:	Right. Do you feel as though you could spend some time talking to Tammy about her behavior? And maybe you could give me some ideas about setting up a reasonable contract for Tammy. That would really help me out.	

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Role Play to Demonstrate the Use of Perception Checks

Teacher: T

Resource Teacher: RT

T: I have just a few minutes before my next class comes in, but I wanted to talk with you. I have a chance to work with a new student, and I'd like to know some of your ideas about her. We've never worked together before, but I know you've helped several other teachers.

RT: Oh, yes.

T: Do you know who Selma is? You've probably seen her around the. . .

RT: Yes, I have. I've never worked with her in an academic situation, but she's dropped into my room a few times to talk. She seems to be having some problems.

T: You can say that again! Anyway, the counselor, Mr. Smith, said that he and the principal had a long talk with Selma and her parents. She expressed an interest in joining my psychology class. You know, I'd really like to help that girl, and I'd like to know what some of your ideas are.

RT: My impression is that you are concerned about Selma joining your class.

T: Well, you know, I really am. I'm not sure if she can handle the course work because it is pretty difficult and she's missed two weeks already. And, also, I worry that this may be sort of a "fad" with her. After she's in my class for a while, she may not be motivated and she could turn into a real troublemaker.

RT: I see. Are you feeling that her skills and motivation may not be as high as the rest of the class which may mean you will have to individualize instruction for her?

T: Yes, I am. The thought of individualizing instruction for one more student bothers me. Where am I going to find the time?

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Role Play to Demonstrate the Use of All Four Communication Skills (Analyzed Version)

Cathy:	You know, *I'm really sick* of coming to all these in-service sessions here at school. On my in-service day I have better things to do than attend these dumb meetings!	DF
Sue:	*You seem really upset* today, Cathy.	PC
Cathy:	Yes, *I am upset and mad.* It seems just when we get some time off, then the principal plans all these little meetings to attend. *I'm tired* of being told how to spend my time.	DF DF
Sue:	*You're saying,* then, that *you'd rather be doing more constructive things in your room,* like *completing report cards?*	P
Cathy:	Yes! And, I wouldn't mind so much if I felt these sessions helped me any.	
Sue:	Tom, *you are shaking your head.* How do you feel about these meetings?	BD
Tom:	Well, *I really like* them a lot. I find them to be informative and usually I come out of them feeling as though I've learned something. *I wish* we'd have more of them.	DF DF
Sue:	So, Tom, *I get the impression you're satisfied* with these meetings. *You often* think *they are worth your time, and you say they are of benefit to you.*	PC P
Tom:	Yes. And, there was something I want to mention. You see, Cathy, I've noticed you at these sessions. Even at the one earlier today you were writing on some of your report cards. Maybe by trying to concentrate more on the presentation it would be more worthwhile to you. Now, I know how you feel, you're kind of angry about all these extra sessions when there are things that need to be done in your room. *I feel pressured,* too, knowing all that needs to be done. Maybe there's a way of getting those reports finished before in-service day so that you can benefit more from these sessions.	DF
Cathy:	I suppose you're right, Tom. I do procrastinate, and it really is my own fault for leaving all those reports to the last day. Like you said, if *I'd just do a few a day prior to in-service day,* then I'd be more appreciative of what is being offered to us.	P

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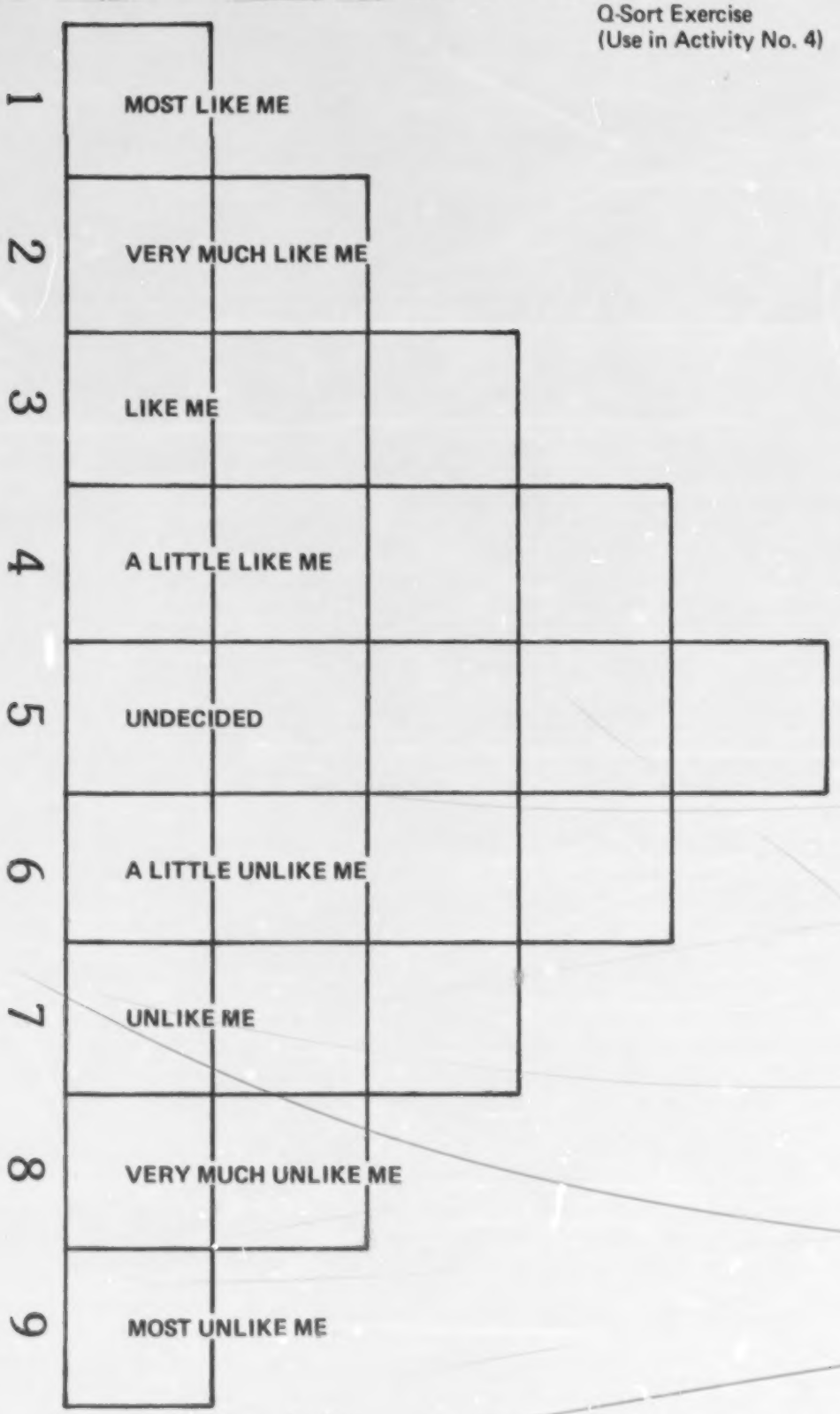
Participant Materials: Worksheets

Q-Sort Exercise
(Use in Activity No. 4)



(Use in Activity No. 4)

Q-SORT EXERCISE

Has attitude of being right frequently 1.

doesn't let personal feelings and values interfere with communications 2.

draws wrong conclusions prematurely 3.

changes mind or opinion frequently 4.

avoids giving the impression of being preoccupied 5.

accepts others' ideas freely 6.

gives advice too often 7.

doesn't dominate the conversation 9.

listens attentively while others are speaking 10.

sometimes lets others know how s/he is feeling at the time 11.

sometimes checks to see how others are feeling 12.

doesn't make an effort to understand others problems and/or needs 13.

states or elicits problems (nature, cause) effectively 14.

doesn't clarify the use of words or terms others might not be familiar with 15.

asks penetrating questions (asks for more than a yes or no response) 16.

seeks information from others in a disorganized, unsystematic manner 17.

offers only one alternative solution to the student's problem 18.

rephrases what others say to make sure s/he understands their thoughts clearly 19.

is emphatic 20.

looks others in the eye when speaking and listening 21.

isn't flexible 22.

sometimes makes others feel inadequate 23.

is not open to valid criticism 24.

values others' opinions 25.

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Use in activity No. 4

Observation Form I - Paraphrases

1. Listen to the conversation.
2. When you hear a paraphrase of a statement, write it in the appropriate column.
3. Following the conversation, discuss your observations with the rest of the group.

Consultant 1's Paraphrases	Consultant 2's Paraphrases

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Role Play I

You are a **senior high biology teacher.** Fred, a student in one of your classes, is behind in his class assignments and weekly written exams. You know he has some learning problems as he is assigned to the resource room for two periods a day. However, you generally feel that he should do exactly what everyone else is doing if he is assigned to your class. Plus, you do not have time to help students individually. You are meeting with the resource teacher now for the first time.

Role Play I

You are the **resource teacher** in a senior high school. One of your students is having trouble in the biology teacher's class. The student, Fred, is capable of doing the work but has trouble with written assignments and tests (he could tell you the answers easily but struggles when he has to write them down.) So, Fred is behind in class assignments. This is your first conference with the biology teacher. You want to find out what problems Fred is having, what are the alternatives, and how you can help Fred and the teacher.

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(Use in Activity No. 4)

Role Play II

You are the **administrator** of a school district. The special education director for your district has asked to talk with you about conducting a five day in-service workshop for special education personnel in the district. He thinks that such an in-service will prepare them to meet the requirements outlined in new federal legislation for special education. You are not necessarily opposed to the idea, but you are worried about: (1) cost, (2) the length of time required for the in-service, and (3) how the regular teachers and administrators will react to special education personnel receiving so much time for in-service. After all, what if they also demanded five days of training? The total school year and budget could be spent on in-service training.

Role Play II

You are a **special education director** for a school district. You are meeting with the administrator of your district to discuss conducting a five day in-service workshop for the special education personnel in the district. You think that such an in-service workshop would prepare them to meet the requirements outlined in the new federal legislation for special education. You are anxious that your district comply with this legislation because you see it as an opportunity for advancing services for handicapped children. You also know that the state department will be monitoring your district's compliance.

The cost of such a workshop would be minimal. You and a special education director from another district will conduct it. All you need is money for supplies and coffee, and five days off, so that you can help the other special education director conduct the same workshop in her district.

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(Use in Activity No. 4)

Role Play III

You are the **parent** of a girl named Sally. Sally was evaluated by a special education teacher who decided Sally needed special instruction in a resource room. Sally's principal called you last week to tell you about Sally's problem and to set up a conference with you and the resource teacher. You are against Sally being placed in a special class. Your cousin's son was placed in a special class four years ago, and now he seems to be different than he was before. You think the school is not being totally honest about Sally's placement and that they believe Sally is retarded and are not telling you. In order to keep Sally from the situation your cousin's son was in, you have decided that Sally should not receive the help. You are going to confer with the resource teacher now about Sally's placement.

Role Play III

You are the **resource teacher.** Recently you evaluated a student named Sally. You determined that she needed special instruction in the resource room for two hours a day in math and reading. She is two years below grade level in both subjects. The regular class teacher agrees that she needs additional help. However, the parents are against the program even though Sally will remain in the regular class for the majority of the day. You are now going to confer with the parents about Sally's need for individualized instruction and the advantages of her coming to the resource room.

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Role Play IV

You are a **regular class teacher.** The principal placed a hard-of-hearing child, Bob, in your class for a half day each day. You include Bob in all the activities you have the rest of the class do in the morning. In the afternoon Bob goes to a resource room. The resource teacher has contacted you twice to see if s/he could coordinate Bob's activities in your class with his activities in the resource room. *You see no point in this* because Bob is receiving special help in the afternoon that helps his hearing problem. You don't want to work with the resource teacher because it is a waste of your time.

Role Play IV

You are the **resource teacher.** During the afternoons, Bob, a hard-of-hearing student, is in your resource class for remedial instruction in reading, math, and writing. You want to coordinate his program with the regular class teacher who has Bob in the mornings. However, you have run into a brick wall both times you have approached her/him. The regular class teacher has given you the impression that the resource room takes care of all Bob's problems and that there is no need to coordinate services between the two classes. You are meeting with her/him to try, once again, to coordinate your programs. You are concerned about what Bob is learning in the mornings and how it fits in with your program.

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Role Play V

You are the **regular class teacher**. A few weeks ago you asked the resource teacher if s/he would help you individualize the math program for three students in your class. The resource teacher was more than willing to help you. However, s/he decided for you what changes you needed to make with little input on your part. Each time you tried to make suggestions, the resource teacher treated them lightly and suggested a better way to do it. S/he is so directive in giving advance that you feel s/he thinks you are a incompetent teacher who couldn't do the work without help. You are supposed to continue working with the resource teacher for at least two more weeks in order to reach the goal you both set, but you are tired of the resource teacher "running the show". You feel at this point that the math program is the resource teacher's and not your own program. You are going to confer with the resource teacher now about the math program.

Role Play V

You are the **resource teacher**. A regular class teacher asked you for ways to individualize the math programs of three children in her/his classroom. In the beginning the regular teacher was anxious and willing to work with you on the math program and generally accepted all of your ideas. Within the last two weeks the regular teacher has seemed less willing to talk with you and take your advice. You still need to work with her/him for at least two more weeks in order to reach the goal you both set. You are now going to confer with the regular teacher. You plan to discuss the individualized math program and to offer her/him more suggestions for it. You also want to talk about how you feel about the situation and to find out how the regular class teacher feels about it.

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(Use in Activity No. 4)

Observation Form II – Role Play

1. Listen to the conversation between role players (do not talk with them).

2. Keep a tally of who said the paraphrase, what they said, and the response to it.

3. Also take notes on the effect the paraphrase, and the response to it, had on the conversation. Did it stop the conversation? Change the "tone" of it? Cause one of the participants to non-verbally react, etc.?

4. Following the conversation, show the role players your notes and give them your impressions of their use of paraphrasing.

Who said it?	What did they say? (Record the statement and the paraphrase.)	Effect produced by the response?

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Script: Perception Checks

Resource Teacher: RT
Classroom Teacher: CT

CT: Say, Cathy, I need to talk to you about Tammy. I'm just having a terrible time with her. I just can't get her to do anything in my classroom. She won't complete her math, she bothers others all the time, she can't read anything, I just don't know what to do.

RT: I get the impression that you're feeling pretty frustrated with the situation. Is that right?

CT: Exactly. I have 21 other kids in my class to worry about and I just can't tolerate Tammy's constant nagging and immaturity.

RT: It sounds, too, like you're feeling confused about how to handle her behavior and her academic problems?

CT: Yes, I think the hardest thing for me to do is plan what she should be doing academically. She's so far behind the others that I can't place her in any reading or math group, and I know then that she just doesn't know what to do with her time.

RT: Do you feel as though Miss Schlampp could be helpful to you in helping to locate materials?

CT: Yes, but I just don't have the time to run up to the IMC every day and plan for an hour with Miss Schlampp what I'll do with Tammy. That's not fair to the other kids.

RT: So, my impression is that you're confused about what materials to use, you're frustrated with Tammy's behavior, and feel as though the time commitment is unreasonable.

CT: Right. Do you feel as though you could spend some time talking to Tammy about her behavior? And maybe you could give me some ideas about setting up a reasonable contract for Tammy. That would really help me out.

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Observation Form III for Perception Checks

1. Watch the role play.
2. Record when a perception check was used and what effect it had on communication.
3. Be ready to discuss your observations with the large group.

	Perception check	Effect on communication
Resource Teacher		
General Education Teacher		

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Issues

Choose one of the topics below or another topic not listed to discuss in your small group. What are your feelings about these issues?

ability grouping

grading

legalizing marijuana

reincarnation

standardized testing

open-space classrooms

premarital sex

mainstreaming

busing

affects of alcohol on the system

abortion

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Observation Form IV for Discussion of Issues

1. Down the left side of this page list the people whom you will be observing.
2. As you listen to the conversation record what communication skills are being used by whom.
3. You may wish to abbreviate: perception checks - PC; paraphrasing - P; behavioral descriptions - BD; description of feelings - DF.
4. Be ready to discuss your observations with your group when the discussion is over.

Name	Communication Skills Used

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(Use in Activity No. 4)

Observation Form V

1. Listen to the conversation among the role players.
2. Make a tally mark for each time each uses a paraphrase, perception check, etc. Also jot down a few words of the statement that included the paraphrase, perception check, etc.
3. We will then discuss your observations.

	Role Player No. 1	Role Player No. 2	Role Player No. 3
Paraphrase			
Perception Check			
Behavior Description			
Description of Feelings			

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Exercise with Activity No. 20 - Social Learning

BEHAVIORAL SPECIFICITY AND TARGET IDENTIFICATION

1. Whenever I see Tommy with his thumb in his mouth I tell him that big boys don't suck their thumbs and then pull his thumb out. He just keeps putting it back in his mouth and this really gets me mad. Then, I yell and threaten him with a spanking. This usually results in him leaving the room. It's getting to be that I'm avoiding Tommy because I can't stand to see him suck his thumb.

2. Jane has been really hard to live with lately. She's been giving us trouble at mealtime by always causing a mess. This has everyone upset and angry. We can't seem to sit down and have a pleasant meal anymore. I think she's spilled her milk every day this week. She used to hardly ever spill. Now we have to spend half the time cleaning up the mess. Mealtime is supposed to be enjoyable but it certainly hasn't been lately.

3. Carl has been super hyper these days. I think he's growing fast or something. Lately he runs around the house all the time. Outside it's O.K., but inside it's driving me nuts. I've told him a hundred times to stop the running but he keeps it up. I've tried spanking him but that hasn't done any good either. I just don't know what to do. Why is he doing this all of a sudden?

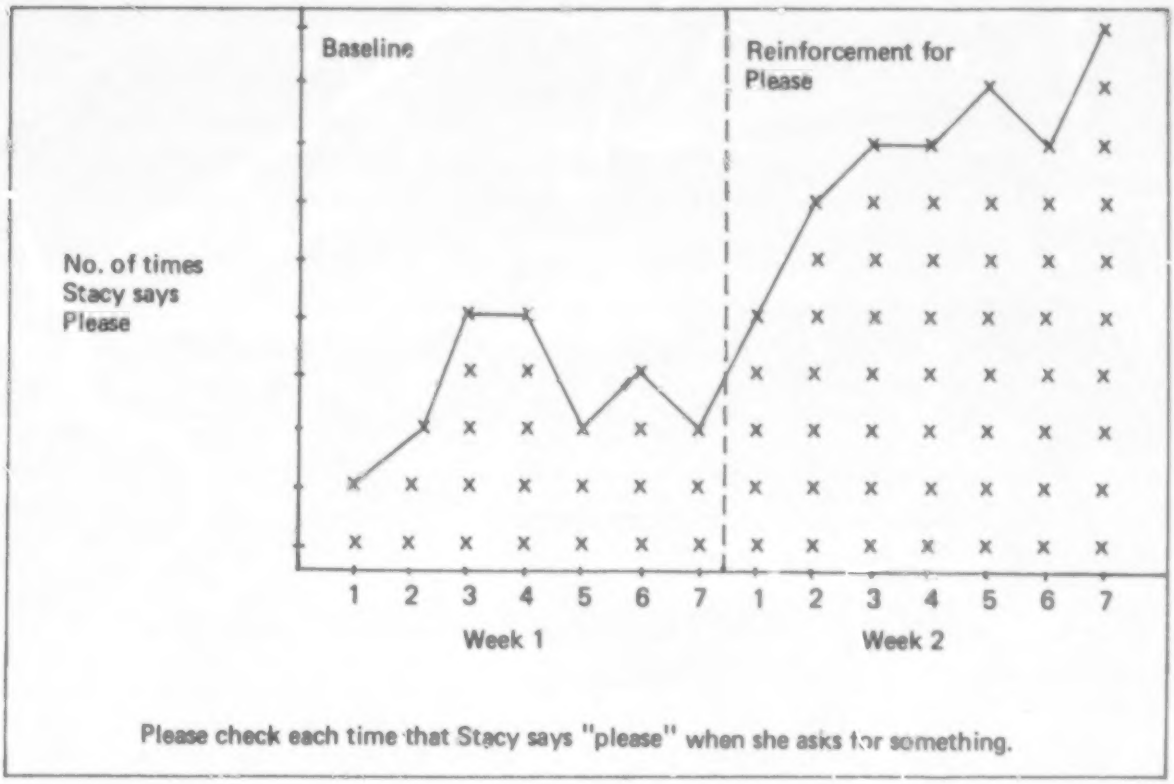
4. I can't take Betsy to the supermarket with me anymore. She won't stay with me and is always getting into different things. Last week she knocked down a whole display of soup cans. I was totally embarrassed. When she's not getting into things she's asking for all kinds of junk food. When I told her she couldn't have any she started screaming. I had to give her the candy to shut her up. That's the last straw though. I'm not taking her with me anymore.

5. Jamie has become so demanding lately. I can't leave his side for one minute at home. I can't even fix dinner without him pulling at me and whining. He'll play fine with his toys when I'm in the room but as soon as I leave he's right after me. This really has me uptight. This seems to be getting worse all the time.

Instructions: With each case identify the specific problem behavior present.

Use with Activity No. 21 – Social Learning

EXAMPLE CHARTS AND GRAPHS



Please check each time that Stacy says "please" when she asks for something.

Behavior Notes	
Home-	Signature _____
School-	Signature _____

Dry Pants Data		Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Home: Did John have dry pants all day?	Yes							
	No							
School: Did John have dry pants all day?	Yes							
	No							

Good Behavior Card — Day - Monday

Write down one thing that Kim did good today.	Home:
	School:

Jackie's Morning Checklist: Monday

Behavior:	Yes	No	Comments
Dresses self by 8:00			
Makes bed before school			
Brushes teeth independently			
Eats breakfast			

Exercise with Activity No. 24 - Social Learning

BEHAVIORAL SPECIFICITY AND TARGET IDENTIFICATION

1. Whenever I see Tommy with his thumb in his mouth I tell him that big boys don't suck their thumbs and then pull his thumb out. He just keeps putting it back in his mouth and this really gets me mad. Then, I yell and threaten him with a spanking. This usually results in him leaving the room. It's getting to be that I'm avoiding Tommy because I can't stand to see him suck his thumb.

2. Jane has been really hard to live with lately. She's been giving us trouble at mealtime by always causing a mess. This has everyone upset and angry. We can't seem to sit down and have a pleasant meal anymore. I think she's spilled her milk every day this week. She used to hardly ever spill. Now we have to spend half the time cleaning up the mess. Mealtime is supposed to be enjoyable but it certainly hasn't been lately.

3. Carl has been super hyper these days. I think he's growing fast or something. Lately he runs around the house all the time. Outside it's O.K., but inside it's driving me nuts. I've told him a hundred times to stop the running but he keeps it up. I've tried spanking him but that hasn't done any good either. I just don't know what to do. Why is he doing this all of a sudden?

4. I can't take Betsy to the supermarket with me anymore. She won't stay with me and is always getting into different things. Last week she knocked down a whole display of soup cans. I was totally embarrassed. When she's not getting into things she's asking for all kinds of junk food. When I told her she couldn't have any she started screaming. I had to give her the candy to shut her up. That's the last straw though. I'm not taking her with me anymore.

5. Jamie has become so demanding lately. I can't leave his side for one minute at home. I can't even fix dinner without him pulling at me and whining. He'll play fine with his toys when I'm in the room but as soon as I leave he's right after me. This really has me uptight. This seems to be getting worse all of the time.

Instructions: With each case identify the specific problem behavior present.

Exercise with Activity No. 27 - Social Learning

Contingency Contract: Hand-out

This agreement specifies the mutual responsibilities that Mrs. Carlson, Mr. Barrett, Mrs. Barrett, and Dan Barrett have agreed upon in regard to the spoon usage program for Leslie Barrett. Mrs. Carlson will use a hand shaping procedure to teach Leslie correct usage of spoon during the noon meal at school on Monday thru Friday. Mrs. Carlson also agrees to send daily progress notes home with Leslie. Mr. Barrett will use the same procedure with Leslie during all of the evening meals and Mrs. Barrett will assume responsibility for all breakfast meals. Dan Barrett will use the procedure with his sister on weekend noon meals. All of the Barrett's will complete the daily progress note on their meal assignment. Mrs. Barrett will see that this note is returned to Mrs. Carlson on school morning.

All those using this teaching procedure will reinforce Leslie for her successes with social praise and pats on the back. If Leslie uses her fingers inappropriately to eat, the food is to be removed from her mouth and her meal removed for a two minute time out. If Leslie is timed out for using her hands, all are to say "Leslie, you did not use your spoon. You were using your fingers. You get a timeout." When the timeout is over, say, "Let's use our spoon, O.K.!" Each person should only use as much hand guidance as is necessary for Leslie to successfully use her spoon.

Mr. and Mrs. Barrett agree to take each other out to eat at their favorite restaurants if they meet the contract commitment for 2 weeks consecutively. Mr. and Mrs. Barrett also agree to pay Dan an extra 50 cents a week allowance for meeting his weekend commitment.

All parties agree to attend a weekly progress meeting to be held in Leslie's classroom at 3:00 p.m. on Friday afternoons. We have all read and agree to the above responsibilities:

Special Ed. teacher	- Betty Carlson
Father	- Tom Barrett
Mother	- Grace Barrett
Brother	- Dan Barrett

(This contract may be changed at any time by the mutual agreement of all parties.)

Exercise with Activity No. 31 - Social Learning

CONSTRUCTIVE CRITICISM

The ability to provide feedback suggesting that the other person behave somewhat differently is a skill that is useful to all. This skill should be particularly useful to the educator who must act as consultant to family members of the severely handicapped.

The technique of sandwiching constructive criticism between positive statements has been found to be an effective advice giving technique. Based on the following brief descriptions, practice using the "sandwich method" of constructive criticism.

Case No. 1

Mother is active in parent organization and has just brought in new supplies for your classroom. The class is in session and one of the boys has been hitting several of the other students. The teacher has just given this boy a timeout behind the room partition. When this mother sees the boy behind the partition she immediately goes back and says, "Jimmy, you're all alone. Would you like me to keep you company?".

Case No. 2

The parents of a child in your class both attend monthly progress meetings regarding their child. They are interested but have consistently failed to follow through on commitments (e.g., to see that Bob brushes his teeth every morning before school). They have objected to the use of a contingency contract but you now feel that one is necessary.

Case No. 3

Mr. Peterson is the only father who has regularly come to your classroom and observed his child. His child, Sarah, has been making progress on learning how to print her name. At this point Sarah has learned to trace all the ietters of her name. Mr. Peterson watches Sarah and says, "You can't even print your name by yourself yet. You've been working on that for six weeks."

Parent Involvement Programs---
A Growing Trend in Special Education

The following reports describe several model programs for parents. These programs focus primarily on counseling and training. They help parents perceive their children in more positive ways. Techniques for behavior management are developed and information about community services is shared. These programs provide a forum where open communication between parents and professionals can take place.

PARENTS AND PROFESSIONALS: A PARTNERSHIP IN SPECIAL EDUCATION

Martin A. Feldman, Robert Byalick, Marion Preston Rosedale

Parents have learned that a minimum of contact with their children's schools is best. Being called to school often results in having to deal with the school's contention that their child is not coping adequately, either academically or behaviorally. Parents are then left with the burden of trying to resolve these difficulties and are generally as perplexed about what to do as is the school.

It is imperative that something be done to alter the negative conditions that have traditionally been present when parents and school officials are together. Supportive interaction is particularly important when students reach adolescence and parents' hopes regarding their children's return to regular education placement dwindle. Frustration from long term special placement of their child may lead parents to despair and hopelessness. Then even the fanfare that usually accompanies new approaches to educating the handicapped fails to generate enthusiasm, and bitterness and self recriminations may intensify. Remorse and disappointment can be all the more pernicious when parents give up, for then their children also often give up.

The literature in special education regularly cites the need for parent involvement (Calvert, 1971; Kelly, 1973; Kinsley, 1971; McKinnon, 1970). It points to the need for providing parents with some understanding of the nature of their children's problems and indicates the importance of sharing educational and treatment methods and goals (Hubbard, 1967; Jessell & Rothney, 1965; Wetter, 1972). However, the literature does not point up the potential for growth which the parents may provide or the value of developing a consistent approach in dealing with the individual by cooperation between home and school.

The probable cause for these omissions is the belief that therapy and education should be left to professionals, not to parents. However, inasmuch as parents can more greatly influence their children than professionals because of both the time and the emotional intensity shared between parents and children, parents can play a more positive, active role than that traditionally left to them.

Center for Community Adjustment

How the parents' role can be formed and guided in a specific context is demonstrated at the Center for Community Adjustment. The center is part of a suburban New York City special education board which draws students from 56 local community school systems. Tuition is provided by both local school districts and the state; there is no tuition fee charged to parents.

The setting was designed to accommodate multiply handicapped youngsters aged 14 to 21 whose previous special education placement had been in schools for the brain injured or emotionally disturbed. A large majority of these 55 boys and 22 girls had been in special facilities for most, if not all, of their academic careers. Academic skills ranged from untestable to 11th and 12th grade reading and arithmetic levels. Behavioral problems included extreme withdrawal, noncommunication, hostile

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and aggressive outbursts, lack of self help skills, hyperactivity, distractibility, and seizure disorders. Language and social skills varied greatly. Some of the youngsters had been hospitalized in psychiatric hospitals for acute outbursts of aggressive and/or destructive behavior. The vast majority had been exposed to one or more forms of therapeutic intervention, group and/or individual, at some time in the past. The results of such intervention were questionable.

The youngsters were bused daily from as far away as 25 miles. Some spent 60 minutes traveling each way. The school day lasted for 4 1/2 hours since transportation schedules conformed to those of the local school districts which transported the students. The goal was to maximize the value of the time the students spent at the center and to develop as much carryover as possible into the home.

The Program

Innovations

The program and setting were nontraditional in two ways. First, there were no guidelines or precedents in working with these multiple handicapped youngsters who seemed to have benefited as much as they were going to from previous school placement. School personnel and parents agreed that continuing at the former schools would result in minimal additional growth for the youngsters. Second, the current setting was developed along the lines of a day center rather than a school. Students were called citizens, and social/behavioral skills were emphasized more than academic skills.

There was neither need nor desire on the part of the staff to maintain the traditional role definitions and status distinctions often found in school settings. Course offerings were provided by anyone who had the interest and the expertise. The citizenry was offered course options so that specific rigid curricula were not mandatory. Program modifications were a regular part of the center's functioning. There was no prescribed curriculum that might discourage growth.

Weaknesses

The program lacked two features: a sense of community because of the spread of the geographic area served and carryover into the home. These needs were met by implementing a regular parental participation component to the program. Working with parents meant that time had to be taken from more traditional ventures such as student counseling, teacher conferences, and evaluation.

Reaching the Parents

Letters were sent to approximately half of the families during the second month of the program stating that we had known the youngster for a short while and that we would like to share our observations and feelings about him/her. We were eager for the parents to share their feelings, aspirations, and concerns with us, in the hope of reinforcing our mutual efforts. In response we received approximately 20 requests for appointments. Roughly one-third or 7 responses indicated that both father and mother would come; the rest involved only one parent. The initial contact was established to share information between home and school and not to communicate problems.

The Beginning Approach

The first sessions dealt with the child's response to the center, his/her functioning in the program, his/her behavioral strengths and weaknesses as perceived by the parents, his/her occupational potential, and the goals and methods being pursued by the center's staff. It was stressed that previous diagnostic labeling was not used at the center. Behavior change was the primary concern. Instead of discussing illness and categorization, the staff tried to make concrete statements of behavioral objectives. This approach conformed to the philosophy that diagnostic categorization can be detrimental to both educational and therapeutic intervention, and it carries with it what Mandler and Kessen (1959) refer to as surplus meaning. It also tends to be frightening and overwhelming.

Stereotyping in special education, particularly among laymen, often focuses on the least functional, most bizarre end of the diagnostic spectrum.

Explaining Our Methods

The center viewed the use of a token economy not as a panacea for coping with behavioral problems or as the goal of the program, but rather as a tool to provide some structure for the citizens. We believed that the consistency provided by a concretely structured program in which behavioral contingencies, rewards and punishments, were clearly elucidated would increase the self confidence of the students by encouraging them to appreciate the predictability of the future as determined by their own actions. When the citizens began to experience success, supplemental methods were implemented including student group work as reviewd by Feldman (1971) and community involvement such as job placement and training for those citizens who could profit from such experiences.

Making Suggestions

Where it was appropriate, carryover of behavioral techniques into the home was suggested to the parents. This was done after discussion of the basic tenets of behavioral theory, and a review of both the range of application of behavior modification techniques and some of the relevant research. Frequently the manipulative aspects of behavioral re-education and parental feelings that extrinsic motivation was stressed rather than intrinsic, were discussed at length. Although some parents were more hesitant to attempt such a program at home than were others, ultimately all indicated a willingness to try.

Parental Response

Most of the parents responded well to use of a home behavioral program. It provided a new technique for working with their child and a means of assessing success. Often it reduced parent-child conflicts and battles of will. For the youngsters, the home program was a carryover from school and already familiar to them. In this area, they began at a more proficient level than their parents. The behavioral programs also reduced the conflicting parental demands often imposed on the children and provided a consistent predictable framework in which to operate. It gave the youngsters the chance to succeed.

Open Communication

The parents shared with us many of their concerns, i.e., about their children's vocational potential, about what would happen to them after the parents "were gone," and about their disappointment in not having overcome problems in the past. They also expressed a greater patience with their children and themselves. In addition, quite a few parents talked about their increased appreciation for their youngsters' strengths rather than an almost exclusive concern with their weaknesses. To some extent the sharing between school and home helped lessen the self recrimination felt by many parents and possibly removed one obstacle in the path of more satisfactory parent-child relations.

Conclusions

Parental response to the staff's availability exceeded our original expectations. They have shown a willingness to work through problems of long standing; they have shared their frustration and despair; and they have indicated, in most instances, that they have not given up. In some cases a greater cohesiveness has emerged. This is reflected in parents and children communicating with increased awareness of both the individuality of each family member and a lessening of the sense of isolation often experienced. There has also been a decrease in denying or avoiding problems. Finally, a change in focus——from the child's dysfunctional behavior to his/her strengths——has been most noticeable.

Parents have begun to have a greater trust in and satisfaction with special educational facilities, professionals, and educators. They have begun to view themselves as being capable to deal with their children and as being potent forces in their children's education. Efforts toward including parents on an equal status basis should be pursued vigorously.

References

Calvert, D. R. Dimensions of family involvement in early childhood education. Exceptional Children, 1971, 37, 665-659.

Feldman, M. A. The effects of group intervention upon the academic attitudes and achievement of junior high school pupils. (Doctoral dissertation, Hofstra University, 1973). Dissertation Abstracts International, 1973, 33, 5510-B.

Hubbard, E. H. Parent education and handicapped children: The school as a community catalyst. Adult Leadership, 1967, 41, 13-38.

Jessell, J. C.; & Rothney, J. W. The effectiveness of parent-counselor conferences. Personnel and Guidance Journal, 1965, 44, 142-146.

Kelly, E. J. Parental roles in special educational programming—a brief for involvement. Journal of Special Education, 1973, 1 (4), 357-364.

Kingsley, I. V. Parents can help with school difficulties. Exceptional Parent, 1971, 1, 13-15.

McKinnon, A. J. Parent and pupil perceptions of special classes for emotionally disturbed children. Exceptional Children, 1970, 37, 302-303.

Mandler, G., & Kessen, W. The Language of Psychology. New York: Wiley, 1959.

Wetter, J. Parent attitudes toward learning disabilities. Exceptional Children, 1972, 38, 490-491.

THE CHALLENGE OF PARENT EDUCATION

Christine Y. O'Connell

A systematic procedure for relaying information to parents with children of all different ages and handicaps is needed. There has been progress in the areas of individualizing instruction, programming, and evaluating within the classroom. However, educators have virtually ignored the critical influence of the home on child behavior and learning.

The failure of college graduates as well as welfare clients to be effective parents clearly illustrates that "parenting" procedures need to be taught. The high divorce rate, the wide spread experimentation with drugs, the problems parents have coping with a handicapped child, and the "dropping out" from society which exist today all indicate that parents need help.

Each day parents make hundreds of decisions which influence the behavior of their families. Issues such as what clothing a child wears, how much breakfast s/he eats, and how tidy s/he keeps his/her room can explode into major battles if handled unwisely. Each disagreement has the potential of creating a barrier between the parent and child.

Parents need to be informed of the consequences of their interactions with each child.

The Aim of Parent Education

Parents often act unwittingly. However, when they are informed of the need for parental discipline based on established goals for individual children, parents can create open, trusting relationships with their children. Discipline based on the parents' most valued concerns is effective since it allows children to participate in many decision making processes while at the same time firmly establishing the parents' expectations. When parents realize the effects of positive rather than negative home situations, they often begin working toward establishing a better home environment for the entire family.

Educators should be aware of the impact of parental decisions on child growth and development and try to provide parents with alternative modes of interaction based on concrete knowledge.

In order to be effective, parents must be able to anticipate potential problems and decide on a course of action. They need to understand how crucial it is to be consistent: From consistent consequences a child learns what to expect from his/her environment.

When to Begin

For many years courses in child rearing and the family have been offered on an elective basis for high school students. As an initial step, these courses should be required. Beyond that, however, parent education should be conceived of in terms of family-life education at all levels and should include the education of prospective parents as well.

Too often children are exposed only to their parents as models. As adults, many parents function by either accepting or rejecting the methods their own parents used. Assimilation of a wide variety of techniques with an understanding of their results should be the goal of a parent education curriculum.

Defining Parent Education

Education must offer something more than services such as counseling, speech and physical therapy, medical attention, and advise on developmental growth and nutrition. Although these services are important, they are not complete in themselves. Education must apply the principles of learning theory, including initial assessment, individual programming, and continuous measurement techniques, to optimize learning.

Motivating Parents

Motivating parents to attend meetings, to try new procedures systematically, or even to help a child with his/her homework is often a frustrating experience. Parents often hesitate to become more involved because of the lack of precedence. The traditional PTA meeting has been organized by parents with little knowledge of the educational theory essential to programming for needs of all the members of the group. Instead, the parent-teacher meeting has become a social hour with a speaker or presentation offering few realistic attempts to help parents solve problems.

To aid parents, continual contact, information, and feedback are needed. One program cannot bring an overnight change in behavior. Additionally, in the past no widespread effort has been made by teachers, principals, psychologists, or counselors to involve parents in school decisions.

The Nisonger Center

The Nisonger Center for Mental Retardation and Developmental Disabilities at the Ohio State University is currently engaged in a parent education program that could serve as a model for other agencies. The Nisonger program is collecting data to provide information pertaining to maintaining parent attendance at group sessions, program content, evaluation procedures, and seemingly minor concerns such as the length of meetings and the preferred time—— all of which have a bearing on the success of any program.

The Nisonger program consists of 12 parents with children ranging from 5 months to 19 years of age. The handicaps of the children include cerebral palsy, Down's syndrome, "inner city" educable mental retardation, and juvenile delinquency. Most of the parents have nonhandicapped children as well, and many of the techniques discussed were also used with them.

The concept behind the Nisonger program was to organize a program for parents motivated to attend the first session. Information was distributed advertising the initial meeting as a planning session for a course with a possible focus on parent-child relations, parent tutoring, and community resources. The program was planned to enable the instructor to speak to parents with children of all ages and handicaps. The theme of the first meeting——common problems and the variety of procedures for dealing with them——continued throughout the sessions.

Observations from the Nisonger program indicate that parents are interested in problems other than their own, are supportive of one another, and can be disseminators as well as recipients of information. As with any program, the first meeting was critical; it set the tone, the expectations, and the pace for those that followed. The first meeting of the Nisonger group included a slide presentation on common problems and natural reinforcers for adults and children. Afterwards a questionnaire was given to determine parental interests, concerns, and family strengths. From this questionnaire an agenda was planned that included a variety of special topics with guest speakers, films, slides, and discussion periods.

To measure the progress of individuals and the group on a weekly basis, two evaluation procedures were used. One was a record of the type of verbal statements made by the parents. The categories measured included asking questions of parents, asking questions of professionals, giving information, praising, and discussing emerging, past, or continuing problems and situations. The other measure was a written evaluation form which asked "What have you done differently this past week based on the meeting last week?" Parents answered with a variety of responses, including reading a book, counting a behavior, using more praise, using token systems, and trying to be more patient.

Opening Communications

The occasional teacher who is concerned about home-school communication and tries to establish communication through weekly newsletters, parents' meetings, or telephone conversations may fail to reach the parent who needs the contact most.

Instead of assuming parental apathy, educators need to reach out to parents. Educators need to reject the notion that they do not have time to contact parents and that others are also too busy. Educators should begin to think of parent education and the resources that a designated parent educator could provide.

When considering new programs and motivation, educators need to emphasize procedures for creating a positive home atmosphere. This can best be accomplished through considering the individual family unit, its resources, and its history of problem solving techniques. Individual teachers can no longer operate in isolation. Parent education, however, cannot be based on the problems and issues of the past. This means that educators must keep abreast of the rapid changes occurring in society and the family. Teachers must have knowledge about parents and their problems in order to be effective parent educators. Parents, likewise, must be involved in school decisions. Together, parents and teachers can strengthen learning. This is the challenge that educators must meet.

A PARENT INVOLVEMENT PROGRAM MODEL FOR HANDICAPPED CHILDREN AND THEIR PARENTS

Wallace Flint
Charlene Deloach

In March 1974 the Tennessee Department of Education provided funds for a pilot program jointly planned by the Shelby County Board of Education and the Department of Special Education and Rehabilitation at Memphis State University. The program was targeted primarily for parents of handicapped children but included activities for all their children, the nonhandicapped as well.

The program was designed to provide information, mutual support, and improved communications among parents of handicapped children in the form of both small and large group sessions; recreation for the children themselves and their nonhandicapped brothers and sisters; and career training for students of special education and rehabilitation. Students beginning preparation for special education teaching were assigned to one or two handicapped children and students of rehabilitation counseling served as assistant group leaders for small parent groups, led by professional group leaders.

All activities were conducted on the Memphis State University campus. A total of 122 families

were registered in the program. There were altogether 168 parents and 184 children attending. Of the 184 children, 118 were handicapped. For the most part, the handicapped children who participated were more severely disabled than the group traditionally served by special education in the public schools.

Almost all of the families had children attending the recreation program while the parents participated in the group sessions. According to 71% of the parents, the option of bringing all their children to the recreation program made it easier for them to attend. Half of these parents brought at least two children regularly.

Children's Recreation Program

Each Saturday morning parents brought their children, both handicapped and nonhandicapped, to the University field house where undergraduate special education students who had been assigned to two or three specific children were waiting for them. The students took the children to one of five gyms where equipment and activities were arranged according to age and mobility of the children. Responsibilities were divided between physical education students and special education students. Physical education students were responsible for activities; special education students were responsible for individual children--for greeting and making friends with them, for moving them through activities, and for seeing that they met their parents and left safely.

The enthusiasm and friendliness of the students were great assets to the program. One parent stated as she arrived late for a session that she had not planned to attend that day until her severely handicapped child got up, dressed, and sat stubbornly in the car until the parent agreed to take her to see her friends. More than half of the handicapped children had either rarely or never been left with nonfamily members before they enrolled in this program.

Parents' Large Group Sessions

Each Saturday parents attended both large and small group sessions. A lecture-discussion format was used for most of the large group sessions. Topics ranged from a talk about social attitudes and the problems and triumphs in raising a handicapped child to financial management, behavior management, and a demonstration of therapeutic recreation activities by an occupational therapist. One large group session was called a "Services Fair." Booths were provided for 21 agencies serving the handicapped in the Memphis area. Parents circulated among the booths getting acquainted with agency staff and services.

Small Group Sessions

Eleven small groups of 8 to 15 parents were formed, with husbands and wives placed in separate groups. A heterogeneous mixture of handicapping conditions and ages were represented in each group. Leaders were professional counselors with training and experience in leading therapy groups. Graduate students of vocational rehabilitation counseling served as assistant group leaders. Emphasis was placed on helping parents gain support and mutual understanding and develop skill in solving special problems with handicapped children. The culminating event of the small group meetings was the formation of "contracts" between group members to take action outside the group meeting to solve problems.

Conclusions

Parents and student workers showed their approval by near perfect attendance and favorable responses in the evaluation. Students felt that the program played an important part in their professional development and several students formed their first close relationships with handicapped children. An expanded parent involvement program has been planned.

THE PARENT–PROFESSIONAL PARTNERSHIP

Raphael F. Simches

It is of great significance that CEC has dedicated this issue of *Exceptional Children* to the parent-professional partnership because it reflects the acceptance of parents as full status members in the planning and decision making process. Today a new relationship is being forged between parents and professionals which recognizes that only by working together can the best results be accomplished for exceptional children. Traditionally, parents have been active in school meetings and conferences and participated in social and extracurricular activities. Now parents of children in special education are acting as teachers, advisors, and advocates.

Parents are assuming new responsibilities because they are working for the best possible educational programs for their children. In the past, many parents of handicapped children accepted existing programs and facilities without argument. They rarely questioned the adequacy of these programs or the wisdom of the judgments of professional educators. Taking an active role in the school, today's parents are not only learning new ways to work with their children, but they are also raising questions about existing programs and pressing for changes and improvements in the educational system.

Parents as Teachers

Parents are becoming increasingly involved in the teaching process. Children with handicapping conditions need extra training; while a normal child picks up many skills on his/her own, a handicapped child needs special help. If the parent is able to train the child at home, s/he is helping the child function more effectively.

Training parents to teach is an important part of many special education programs. In some schools, teachers do this informally; in others, special educators have active parent groups that study behavior management techniques and teaching methods. In many preschool programs parents are directly involved in the teaching process. Preschool teachers train parents to provide the individual instruction that young handicapped children need. Watching the teacher work with his/her child, the parent then does the same activity under the teacher's supervision. Later s/he uses what s/he has learned with other children in the group. The teacher helps the parent understand developmental sequences. Knowing normal patterns of development, the parent is able to understand and facilitate his/her own child's growth.

Parents as Advisors

Parents are increasingly involved in making educational decisions that affect handicapped children. For a long time, decisions about placement and programming were the exclusive domain of professionals. Now parents are demanding a voice in the process. Some parents are regular members of decision making groups; others contribute when their child is being discussed.

As advisors, parents have an important role to play. When experts are considering test scores and diagnostic information, parents can add social and personal anecdotes that give a more complete picture of the child. This special information helps school authorities find placements that suit the child's learning style and meet his/her unique needs.

Parents as Advocates

In recent years, parents of handicapped children have become leaders in making changes in the educational system. Concerned with improving the quality and quantity of educational programs, parents have worked for changes in administrative policies, new laws, and court decisions that increase the opportunities available to handicapped children. Parents have had a major impact in the following areas:

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Parents have contributed to efforts to insure equal opportunity for handicapped children. Specifically, they have taken cases to court to protect the right of all children to a free public school education. Speaking for children excluded because of the severity of their handicapping condition, parents have won judgments that underline the local school districts' responsibility to these children. These decisions suggest that all children, regardless of the nature or the severity of their handicaps, are educable.

Insuring a handicapped child's right to due process under the law is another important victory that parents have helped achieve. As a result, many state laws and new federal legislation protects handicapped children from arbitrary and capricious changes in placement.

Parents are leaders in the movement to increase educational accountability. No longer content with the mere existence of programs, parents are demanding programs that show results——measurable behavioral changes in children. Instead of blaming children for failing to progress, parents who argue for accountability insist that educators are responsible for the progress of children in school.

By assuming new roles, parents are bringing about important changes in the educational system. Through their involvement in the classroom, parents are learning skills that enable them to help their children more effectively. Advising decision making groups, parents are helping educators find appropriate placements for children. As advocates, parents are protecting the legal rights of the handicapped, and are working to extend and expand the educational opportunities available to all children. From token involvement in the schools, parents are emerging as a potent force capable of constructively changing the entire educational system.

A PARENT'S VIEW OF WHAT PUBLIC EDUCATION SHOULD ACCOMPLISH

Philip Roos
National Association for Retarded Citizens

Education is essential to all human beings; without it no individual can hope to survive, much less become a contributing member of society. Yet, until recently most mentally retarded children were denied access to adequate public education (National Association for Retarded Citizens, 1974c; Roos, 1971). Ironically, those in greatest need, the severely and profoundly retarded and the multiply handicapped, were least likely to be served. It is not surprising that parents of retarded children, and particularly the National Association for Retarded Citizens (NARC), formerly National Association for Retarded Children, have long agitated for adequate public education for the mentally retarded.

In recent years, NARC and its state and local units have become increasingly militant, challenging the nation to meet its constitutional mandates through national policies (NARC, 1968, 1971, 1973b, 1974b, 1975c, in press-b), litigation (New York Association for Retarded Children v. Rockefeller, 1972; Pennsylvania Association for Retarded Children v. Pennsylvania, 1972; Roos, 1972; Wyatt v. Stickney, 1972) and support of national and state legislation (Felicetti, 1975; Roos, 1972). Parent advocates have been joined in these efforts by professionals and administrators and have, with increasing frequency, found strong allies in such organizations as the Council for Exceptional Children (CEC) and the American Association on Mental Deficiency (AAMD).

Counterproductive Parent-Professional Interactions

Parents and professionals have not always worked harmoniously together. Indeed, the genesis of NARC has been attributed in part to parental frustrations stemming from professional apathy, neglect and indifference (Roos, 1970, 1975a). Years of unfortunate interactions between parents and professionals have generated negative stereotypes, many of which still linger.

Professional Mishandling

Professional mishandling of parents of retarded individuals has, unfortunately, been common. Some of the most frequent types of mishandling include the following:

Professional Ignorance. Even today, many professionals in the medical and behavioral sciences have little knowledge of mental retardation. Some fail to recognize mental retardation or, when they suspect its presence, they dispense misinformation. For instance, some parents are still advised that their child will outgrow the difficulty, while others are told of the "hopelessness" of their child's condition and the necessity for immediate institutionalization.

Professional Hopelessness. Medically oriented professionals, in particular, tend to consider mental retardation as an incurable disease, and hence as hopeless. This attitude generates self-fulfilling and self-limiting prophecies which impede the development of retarded individuals. Parents usually detect such defeatist attitudes and either adopt similar expectations or resent those who hold such negative expectations toward their child.

Referral Ad Infinitum. The tendency of some parents to shop around in the vain hope of obtaining a satisfying answer to their unresolved questions is well known, but in many cases professionals have initiated the referrals for which parents are later held responsible. Often such referrals reflect lack of professional expertise in mental retardation and/or reluctance to confront

From Educational Programming for the Severely/Profoundly Handicapped. Copyright 1977 by the Division on Mental Retardation, The Council for Exceptional Children. Reprinted by permission.

parents with the traumatic conclusion that their child is retarded. Ironically, some professionals are less able to accept retardation in a child than the child's own parents, leading to the peculiar situation of parents trying to convince the professional of the retardation of their own child.

Veil of Secrecy. Some mental retardation professionals have adopted the approach once popular among medical and mental health professionals of withholding information from clients, allegedly because the information would be too threatening, too uncomfortable, or in some other way would be destructive to the client. The erection of this veil of secrecy may be the more fundamental reason that some professionals minimize their own feelings or insecurity by maintaining a monopoly on information of potential value to their clients.

Deaf Ear Syndrome. Parents have at times become infuriated when their most earnest requests of professionals have been totally ignored. They sometimes feel that any suggestion made by a parent regarding his/her own child is categorically dismissed. This not uncommon professional disregard for parental suggestions of information may be the result of destructive stereotypes of parents.

Professional Omniscience. Whereas some professionals candidly admit ignorance regarding mental retardation, others exude extraordinary confidence in their own pronouncements. Although they may hint that they possess the key to all ultimate knowledge, they often hoard much of this precious commodity behind the veil of secrecy mentioned above, perhaps suggesting that the naive parents would be totally overwhelmed by exposure to the fountain of knowledge available to the professionals. Their ready recourse to esoteric jargon helps to convince the unfortunate parents of the professionals' omniscient status.

Professional Omnipotence. Related to professional omniscience is the myth of professional omnipotence——the assumption that professionals have the wisdom to make sage decisions about other people's destinies. Even when sophisticated multidisciplinary teams conduct evaluations and develop individual program plans, the child's parents (and the child him or herself) are still frequently excluded from the deliberations and decision-making process. Instead, parents are informed after the fact of the conclusions reached by the team.

Parents as Patients. Since many professionals have developed a stereotype of parents of retarded children as emotionally disturbed people, it is not surprising that they tend to consider parents as prime candidates for psychotherapy. Parents may thus be thwarted in obtaining desperately needed concrete information regarding their child's condition and the availability of services to meet his/her needs. They are likely to be confronted by professionals eager to unravel their intrapsychic conflicts and to explore their marital problems and other areas of maladjustment.

Two popular objectives in counseling parents of the retarded are getting parents to accept mental retardation and lifting the depression which seems to be a common parental reaction. Unfortunately, neither of these objectives is realistic. While parents may fully understand that their child is mentally retarded, it is unrealistic to expect them to accept this situation with blandness and equanimity; our society places too high a value on intelligence. Likewise a state of chronic sorrow has been described as the normal (in contrast to pathological) response of parents to having a retarded child (Olshansky, 1966).

Parental Reactions to Mental Retardation

The impact on parents of having a mentally retarded child typically precipitates reactions which, though not necessarily pathological, tend to frustrate professionals. These reactions may interfere with effective parent-professional interaction and may, in some cases, impair parents' capacity to deal constructively with their retarded child. Common parental reactions to having a retarded child include loss of self-esteem, shame, increased ambivalence, depression, self-sacrifice, and defensiveness (Roos, 1963). Extreme degrees of any of these reactions can obviously interfere with helpful parent-child interaction, as well as with constructive parent-professional relationships.

Whereas many professionals are relatively aware of these parental reactions and of ways of coping with them, they are usually unaware of, and unresponsive to, the serious existential conflicts which are likely to overwhelm parents. Knowledge that one's child is retarded tends to reactivate anxieties which are common to most members of our culture, but which tend to lie dormant in most relatively normal human beings. Many professionals seem to feel uncomfortable discussing these existential conflicts and effectively avoid doing so. They much prefer dealing with the traditional "parental pathology." They may have no easy answers to the existential conflicts which threaten to overwhelm parents of retarded children, and they may experience personal discomfort as their own unresolved conflicts are reactivated.

The degree of impact on parental adjustment resulting from having a retarded child is a function of many factors, including the importance the parents place on having children and whether or not the retarded offspring is an only child. Some of the most critical existential conflicts common to parents of retarded children include the following:

Disillusionment. Our society propagates myths which generate totally unrealistic expectations. As children, we learn to expect success, achievement, wealth, and status. We are taught in innumerable ways to expect wise parents, loving and lovable mates, and perfect children. Experiences gradually erode these unrealistic expectations of ourselves and others, leading to a long series of disillusionments in ourselves, in others, and in life in general.

Many of us channel our yearning for perfection into our children. We hope to realize through them our own frustrated aspirations and our thwarted dreams of achievement and happiness. Since a retarded child is usually an unsuitable vehicle for realizing parental hopes, s/he presents a major disillusionment, often the culmination in a long series of disappointments. If a retarded child symbolizes failure as a parent, the parent may experience serious disillusionment in self. If no other children are present, the hope of eventual fulfillment through one's children is lost forever, and the parent may seek desperately for other avenues toward self-enhancement or s/he may adopt a pervasive attitude of hopelessness.

Aloneness. Our need for intimacy is never completely fulfilled. We have no way of transcending our personal boundaries and fully sharing our feelings and perceptions with another. Neither our parents nor our mate can ever completely meet our desire for complete sharing with another. Many of us yearn to overcome our loneliness through our children; products of our bodies, shaped into our images, literally extensions of ourselves, they represent our last hope for reaching true intimacy. Yet a retarded child may thwart this hope because of his/her limited ability to communicate, or because s/he is unresponsive to his/her parents' attempts to achieve intimacy. As a result, feelings of aloneness are likely to be intensified when a parent realizes that his/her child is retarded. S/he may feel s/he has lost the final opportunity to achieve intimacy and that s/he is henceforth condemned to a life of aloneness.

Vulnerability. A child's early fantasy of omnipotence is soon shattered as s/he is confronted by his/her dependency on others and his/her helplessness to cope with the world. Gradually s/he learns that others, too, are helpless, including his/her parents, teachers, and heroes. Pain, injury, illness, and failure all attest forcefully to personal vulnerability, to the tenuousness of one's control over the world, and indeed to the fragile nature of life itself.

Mental retardation in one's child reactivates feelings of helplessness by dramatically reminding the parent that his/her most precious possessions and dearest dreams can be totally annihilated, and that neither s/he nor any other——human or divine——can do anything about it.

Inequity. Our nation is founded on the premise of justice for all, and we are conditioned from earliest childhood to believe that fairness and justice ultimately prevail. Our world view is predicated on the premise that good will triumph and that, should our judicial system falter, some greater force will ensure that heroes are rewarded and villains are punished. When faced with retardation in one's child, the natural reaction is to ask, "Why me?". The enormity of the apparent inequity is overwhelming. In his/her desperate search for an answer to this question, the parent is likely to

entertain two alternatives: either s/he has sinned grievously and is getting his/her just rewards, or s/he is living in a world in which fairness and justice are fictitious constructs. The former alternative leads to guilt, remorse, and self-recrimination; the latter may threaten basic ethical, moral, and religious beliefs.

Insignificance. As young children, we imagine ourselves to be important figures occupying a central role in the scheme of things, but with maturity comes the realization that we are relatively insignificant, that we are unimportant individuals on a minute planet of a small sun in a mediocre galaxy spinning in an infinite universe. In spite of history which attests to the insignificance of billions of human beings whose trivial lives have been less than noticed, we are raised to strive——some more desperately than others——to achieve greatness or at least "meaning." When greatness escapes us, as it usually does, we are prone to compromise with our early dreams by seeking meaning in fulfilling important and satisfying social roles: husband, wife, father, mother, and so forth. Thwarting of parental roles, as is likely to occur when one's child is retarded, may confront parents with their insignificance by depriving them of one of their few opportunities to achieve meaning.

Past Orientation. People are unique among our planet's living organisms in their capacity to travel through time; they can recapture the past, dwell in the present, or project themselves into the future. Avoiding the present and future by changing to the past is associated with various states, while projecting oneself into the future tends to be associated with mature planning and optimism. Future projection is related to the anticipation of happy and satisfying events whereas the anticipation of unhappiness and frustration tends to block future projections and to foster orientation toward the past.

Generally, parents anticipate their child's future with enthusiasm, looking forward to such events as attending school, scholastic achievement, excellence in sports, graduation, marriage, birth of grandchildren, and career achievements. They are likely to hold an optimistic future orientation. Parents of a retarded child, on the other hand, are prone to view their child's future as a source of increasing frustration and anxiety. They fear their child will face such trauma as scholastic failure, exclusion from schools, inability to work, problems in sexual adjustment, inability to live independently, and a life of loneliness and isolation. Furthermore, as the retarded offspring grows older, services usually become increasingly inadequate, adding to the parents' frustrations. Hence, for many parents of retarded children, the future holds little promise, and they tend to shift from future to past temporal orientation and from an optimistic to a pestimistic attitude toward what lies ahead.

Loss of Immortality. Man's ability to transcend the present and anticipate his own death is a major source of human existential anxiety. Many individuals achieve a type of symbolic immortality through their children; they think of themselves as living on through their children and their children's children. Grandparents' legendary preoccupation with their grandchildren attests to the symbolic significance of continuation of the family line. When a child is retarded, this potential avenue to immortality is threatened; when the retarded child is an only child, this form of immortality is denied the parents, and they are faced with the inescapable prospect of their own finiteness and ultimate loss of identy.

Constructive Parent-Professional Interactions

In recent years parents and professionals have increasingly shifted from adversary stances to cooperative interactions. By joining together and forming voluntary organizations, parents have gradually gained potency as social change agents. They have developed considerable sophiistication in the mechanics of fostering social change as well as in the technical aspects of programming for mentally retarded individuals (Roos, 1970, 1975a).

Parents as Members of Multidisciplinary Teams

Parents are becoming increasingly active participants in multidisciplinary teams, in contrast to their traditional role of being passive recipients of professional services. This significant change reflects not only the impact of voluntary organizations, such as NARC, but it is also the result of several relatively recent scientific developments, including the following:

The relevance of mothers' teaching approaches to their children's performance has been experimentally substantiated (Brophy, 1970; Hess and Shipman, 1965; Wiegerink, 1969).

The impact of early intervention on children's subsequent intellectual and emotional development has been impressively demonstrated (Gray, 1971; Gray and Klaus, 1970; Haywood, 1967; Heber, Garber, Harrington, Hoffman and Falender, 1972; Hunt, 1961). Long-term effects of a deprived environment during the first five years of life seem particularly potent and apparently may significantly lower a child's intelligence quotient (Bloom, 1964).

Curricula, training materials and audiovisual aids specifically designed to assist parents in training their handicapped children are now readily available (Bijou, 1968; Gray and Klaus, 1965; Ferritor, 1970; Wahler, 1969; Wildman, 1965).

Pilot demonstration programs have already impressively documented the success of using parents as implementors of systematic training programs with their own handicapped children. These parents typically are trained to function as extensions of the professional team. They assume a major role in conducting formal training activities, which at times reach considerable sophistication. Pre-school programs (Bijou, 1968; Luterman, 1971), programs for severely and profoundly retarded young children (Smith and Murphy, 1969), and programs for brain-injured children (Salzinger, Feldman, and Portnoy, 1970) have been successfully implemented. NARC is currently engaged in a national program, funded by the Bureau of Education for the Handicapped, of developing materials, workshops, and audiovisual presentations designed to equip parents of severely and profoundly retarded children to orchestrate training efforts with professionals. The program is using the association's almost 1900 state and local units as the conduit for reaching individual parents.

It would be unrealistic to assume that all parents of retarded children will embrace the role of trainer of their handicapped children with equal enthusiasm. Parents of normal children vary greatly in the degree to which they actively participate in the education of their children, and there is no reason to suspect that parents of retarded children differ from them in this regard. Yet in many cases, assuming this new role will mitigate the feelings of frustration and helplessness which are common in parents of retarded children. It is likely to enhance their self-concept and increase their self esteem. Furthermore, as parents adopt formal training responsibilities, their new role should bring them into a closer relationship with professionals by fostering mutual understanding and respect.

Parents as Decision Makers

Parents as well as professionals have been gradually redefining their respective roles. In the past professionals have tended to either assume almost total programming responsibility for severely handicapped children, or they have attempted to avoid any involvement. Parents have adopted reciprocal roles, either totally relinquishing the child to the professional or assuming complete responsibility for his/her care. Hence, until relatively recently, parents of retarded children had only two practical options available to them: either they could institutionalize their child or they could retain the child at home and attempt to meet all his/her needs through their own efforts.

The genesis of parent organizations can be attributed to frustrations resulting from lack of services (Mead and Brown, 1966; Roos, 1970, 1975a). These early groups were deeply involved in developing services for their own children, a pattern which has only gradually been altered as appropriate public services for retarded individuals become available (Roos, 1970, 1975a).

In recent years, public services for the retarded have greatly expanded, and professionals have become increasingly committed to these programs. In general, parents have welcomed these changes, and most favor further expansion of appropriate specialized services for the retarded as well as increasing access to generic services of all kinds. Yet most parents insist on retaining a key role in all decisions affecting their children.

Parental concern with decision-making is primarily focused on two distinct types of situations: they want to be involved in decisions affecting their own child, and they want to participate in decisions affecting the delivery of services to the mentally retarded in general. With regard to decisions affecting their own child, parents are primarily interested in the selection of objectives and goals. An important function of professionals in the decision-making process is to provide parents--and the mentally retarded client him/or herself, if possible--with information on which informed decisions can be based. Preferably alternative courses of action can be objectively described so that choices can be intelligently made among several desirable alternatives. Once the decision has been reached regarding goals, professionals have the primary responsibility for selecting the specific methods and approaches for reaching these goals. Parents might also wish to participate in the selection of methods, however, when several alternative approaches are available. In such instances, professionals would describe the available alternative methods, the advantages and disadvantages of each and, if applicable, their own preferences and proficiencies.

The involvement of parents in making decisions affecting their own children is becoming widely recognized as an essential component of programming for handicapped individuals. National accreditation standards (e.g., Joint Commission on Accreditation of Hospitals, 1973), federal court mandates (e.g., Wyatt v. Stickney, 1972), and federal guidelines (e.g., regulations governing intermediate care facilities for the mentally retarded) already incorporate provisions ensuring the direct participation of clients and/or their parents or parent surrogates in making major programmatic decisions. Policy statements developed by major national organizations likewise reflect this stance. For example, at its 1975 national convention, NARC adopted a resolution on Biomedical and Pharmacological Research on Mentally Retarded Persons in Residential Facilities (NARC, 1975c) which included, among several requirements needed for approval of such research, that: "there shall be competent, voluntary and individual informed consent which is knowledgeable and autonomous and given by the individual, his or her parent or legal guardian without coercion or duress . . ." (p. 2). Similar requirements have been proposed by NARC regarding participation in behavior modification programs (May, Risley, Twardosz, Friedman, Bijou, and Wexler, 1975). The AAMD advocates a similar position, as evident from the following statement regarding individualized program plans: "Recipients of services and their personal or legal representatives should be given a full opportunity to participate in all phases of the development and review of their individual program plan. Where appropriate, parents should be asked to participate in carrying out the plan, as well" (AAMD, 1975, p. 30).

With regard to parents' decision-making role relative to the delivery of services, recent years have brought a noticeable shift in the attitude of parents toward professionals, administrators, and governmental bodies. The trend has been toward activism and even militancy, in contrast to the passivity and dependency of the past. Furthermore, parent organizations have become increasingly effective as social change agents.

Parents as Social Change Agents

The development of parent organizations, such as NARC, has been described in detail (Boggs, 1963; Dybwad, 1959; Katz, 1961; Mead and Brown, 1966; Roos, 1970, 1975a; Segal, 1970). Specific phases have been identified in their evolution from small groups of parents joining together for mutual support to complex organizations with paid staff (Katz, 1961). The functions of these groups have shifted over the years. The most dramatic change has been the gradual relinquishing of the operation of direct services in favor of assuming roles related to catalyzing social change (Roos, 1970, 1975a).

One of the most impressive achievements of Associations for Retarded Citizens (ARC's) has been their highly sophisticated legislative activities at the state and national levels (Felicetti, 1975; Roos, 1972). These groups have buttressed their legislative efforts by articulating their activities with state and federal operating agencies. Typically, they have established continuing liaisons with key staff of

agencies delivering services to retarded persons. Often they are involved in drafting and modifying regulations promulgated by agencies to implement new legislation.

ARC's are increasingly joining forces with other organizations to form coalitions and gain potency relative to issues of common interest. These coalitions frequently include professional organizations, such as the AAMD, CEC, the American Orthopsychiatric Association, and many others. Another approach by parent organizations to fostering social change has been to place key members on state and national boards, task forces, and advisory committees. Hence the Developmental Disabilities Services and Facilities Construction Act has furnished a particularly fertile arena for ARC's direct participation in planning and evaluating services for the developmentally disabled at the state and national levels. NARC has been instrumental in establishing major entities designed to serve as national advocacy and monitoring bodies, including the National Center for Law and the Handicapped and the Accreditation Council of Facilities for the Mentally Retarded. ARC representatives serve on these organizations' boards of directors, as do administrators and professionals. As a result of such activity, parents have had increasingly direct input in shaping services for the retarded.

In spite of the obvious gains achieved by parent organizations, services to mentally retarded persons are still often fragmented and of questionable quality. For example, a recent national survey conducted by NARC (1974c) revealed that only 40% of school aged children had access to appropriate public education. Likewise institutional services for the retarded have come under increasing criticism (e.g., Blatt, 1966, 1970; Kugel and Wolfensberger, 1969; Roos, 1976). As a result, parent organizations have grown increasingly militant. Parents have gradually abandoned their traditional stance of begging and pleading for desperately needed services in favor of demanding services predicated on constitutional rights.

Parents have often been joined by professionals in litigation designed to improve services to the retarded. Litigation to date has focused principally on issues related to right to education and right to treatment (Friedman and Beck, 1975). In general, the courts have upheld the contention of ARC's and individual parents that institutionalized retarded persons are entitled to treatment meeting minimally acceptable standards (e.g., New York State Association for Retarded Children v. Carey, 1973; Welsh v. Likins, 1974; Wyatt v. Stickney, 1972) and that all children of school age——regardless of handicap——are entitled to a public education (e.g., Mills v. Board of Education of District of Columbia, 1972; Pennsylvania Association for Retarded Children v. Pennsylvania, 1972).

When confrontations on these legal issues occur between parents and professionals or administrators, they typically result from problems of timing rather than from conflicts in basic goals or philosophy. Administrators usually concede that services are deficient, but they justify delays in improving situations on the basis of budget limitations, inadequacy of physical plants, lack of staff, bureaucratic obstacles and other "realistic" impediments to change. The typical method for placating parents has been the presentation of plans which incorporate comprehensive services based on such currently popular concepts as normalization and developmental programming. However, parents are no longer willing to accept plans and rhetoric as substitutes for action. They have grown impatient waiting for an idyllic future which never comes.

Formal training programs have been developed to assist parents in assuming monitoring and advocacy functions. For example, NARC recently developed a curriculum and set of manuals (NARC, 1972) to train its units in the evaluation of residential services for the retarded. The manuals include objective rating scales and concrete strategies for articulating efforts with administrators and other professionals. NARC has also designed training programs designed to increase consumer groups' effectiveness as change agents. Modular training materials and related workshops were recently developed to increase the expertise of NARC's state units in relating to federal programs and in ensuring maximum effectiveness in using federal funds to benefit retarded persons. A similar approach has been used to assist the association's local units to foster the development of community-based residential services (NARC, 1973a).

A new approach to advocacy by consumer groups is the establishment of citizen advocacy programs (NARC, 1974; Wolfensberger and Zauha, 1973). These formal, professionally directed programs pair a mature, interested citizen of "normal" intelligence (the advocate) with a mentally retarded person (the protege). The resulting one-to-one relationship can focus primarily on meeting the retarded person's emotional needs, his/her needs for guidance and assistance in dealing with

practical issues, or a combination of both. Advocates are systematically screened, oriented and professionally supervised. An advisory committee, usually including persons sophisticated in legal and programmatic areas, is available as a resource to the advocate. NARC has mounted a federally funded national program designed to train its units in establishing and operating citizen advocacy programs, and the enthusiastic involvement of many of its state and local units suggests that citizen advocacy will emerge as a major function of many ARC's.

These recent developments suggest that parent organizations in the United States, primarily under the aegis of NARC, have matured into potent, sophisticated advocates for the retarded and their families. No longer alone and helpless, parents have demonstrated that they can influence the course of social change in behalf of retarded and other handicapped people.

Potential Problems in Parent-Professional Interactions

Although parents of retarded children and professionals have obviously been drawing more closely together in recent years, it would be naive to conclude that their interactions are uniformly productive and free of conflict. The very complexity of the task of teaching a retarded child and the resulting frustrations are likely to generate tensions. Furthermore, potential difficulties between parents and professionals can often stem from destructive stereotypes, from professional mishandling or from unresolved parental emotional problems. In addition to these common sources of difficulty, other factors which usually remain unrecognized may contribute to problems. They can be particularly troublesome when neither parents nor professionals recognize their existence. Probably the most common of these factors are issues related to values, objectives and priorities, temporal orientation, and competitiveness between parents and professionals.

Values

Although programs for retarded persons are invariably predicated on underlying values, they are seldom made explicit by either professionals or parents. Usually, they remain implicit and may be unrecognized, even by the very professionals who are implementing services designed to achieve goals based on these values. To the degree that the values held by parents and professionals are incompatible, conflicts are likely to emerge regarding program objectives and long-range goals.

An important issue, which is seldom addressed, is the question of "whom does the program serve?". The assumption that programs for retarded persons obviously serve retarded persons is by no means always valid. Other possible beneficiaries of programs include the retarded person's family (e.g., reduce the parental frustrations resulting from having a retarded child in the home), the agency operating the program (e.g., justify increased budgets and expanded staffs), the professional in charge of the program (e.g., establish a favorable reputation), and society (e.g., decrease the number of tax burdens). Obviously the needs of these potential beneficiaries are not always identical, and programs which succeed in meeting the needs of some may thwart the needs of others. It is well recognized that even the needs of parents and their children are not always compatible, and the establishment of human rights committees, ombudsmen, and legal guardians attests to the growing concerns that parental needs not usurp the needs of their handicapped children.

Even when the issue of "whom does the program serve?" has been clearly resolved in favor of the mentally retarded client, lack of clarity may still exist regarding the implicit values on which program objectives are predicated. Examples of commonly held implicit values, which may at times be mutually incompatible, include the following:

Optimizing the retarded person's level of development so that s/he functions as close to his/her potential as possible.

Providing the retarded person with conditions which are as much as possible like conditions experienced by normal persons.

Achieving the highest possible level of contentment and happiness of the retarded person.

Establishing the greatest possible degree of economic independence of the retarded person.

Achieving behavior of the retarded person which is as similar as possible to behavior of normal persons.

Establishing the greatest possible degree of emotional independence of the retarded person.

Each of the values has been rather widely endorsed in recent years, although when applied to a specific individual they can obviously lead to incompatible program objectives. Consequently, if parents, professionals, and retarded clients themselves hold incompatible values, problems are likely to develop.

Objectives and Priorities

Even when parents and professionals share basic values, important differences may exist regarding specific program objectives and their prioritizing. Whereas professionals may tend to stress abstract and academic objectives, parents are more prone to place high priority on practical objectives which have direct implications for their interactions with their retarded child. When such differences exist, professionals may become frustrated and puzzled by the parents' lack of enthusiasm regarding the achievement of certain program objectives. Parents, on the other hand, may feel that no significant gains are being made, since they detect no progress toward reaching those objectives which they consider to be of high priority. In general, professionals tend to emphasize development of new skills (e.g., number concepts, identification of colors, spatial concepts), whereas parents emphasize elimination of socially undesirable and stigmatizing behaviors (e.g., screaming, talking too loudly, irritability). Hence while a professional may derive a feeling of real achievement because of successfully teaching a child to count to three, the child's parents may feel no progress is being made because the child still yells loudly in social situations, thus effectively ostracizing him/or herself and his or her parents from normal social interactions.

Temporal Orientation

Educators tend to be future-oriented in their preparation of their pupils. Parents, however, are often threatened by what they fear the future holds in store for them and their retarded children. Hence, long-range goals may hold little attraction for parents and may, on the contrary, be perceived negatively. For example, middle-class parents may reject the ultimate goal of having their child work in a marginal service job, whereas this same goal may seem highly desirable to the child's teacher. Conversely, parents may place much greater emphasis on immediate objectives than do professionals, and they may appear to professionals to be unduly concerned with what appear to be unimportant objectives, relative to long-range considerations. Yet to the parent who has to cope on a daily basis with the retarded child's behavior, eliminating present frustrations may seem much more urgent than building toward distant goals whose very desirability they may question.

Competition

Parents and professionals may feel, often unconsciously, competitive toward each other in their efforts to educate retarded children. It may be painful for a parent to admit to him/or herself that a stranger is more successful with his/her retarded child than s/he has been. As a result, parents may inadvertently downgrade professional successes, or may even (without being aware of it) undermine professional efforts. On the other hand, professionals may feel threatened that parents, while untrained and unsophisticated, may succeed where they have failed. Some professionals are prone, therefore, to withhold assistance from parents and/or to hold them responsible for their children's problems and failures.

Recommendations for Productive Parent-Professional Interactions

The following recommendations are designed to foster constructive cooperative relationships between professionals and parents. If implemented, they should minimize many of the potential problems previously described.

Parents should be considered as fully participating members of the educational team. Other team members should relate to parents as peers and colleagues and should treat their contributions to the team process with respect, even though they might completely disagree with them.

Professionals should try to accept parents where they are and develop the skill to listen and encourage full disclosure. They should resist the temptation to criticize parental attitudes which conflict with their own beliefs, since doing so would tend to discourage parents from fully expressing their feelings and could reinforce parental feelings of guilt or worthlessness. In order to assist parents in developing constructive attitudes toward their retarded children, it is often helpful to let them verbalize destructive feelings so that they can deal with them and work them through.

Professionals should share all relevant information with parents as the basis for planning and decision-making. Unless there are compelling reasons to do otherwise, parents should have access to the same information, including test findings and written reports, as other team members.

Whereas professionals should have the major responsibility for selecting methodology and technology, parents—— or, when appropriate, the clients themselves——should have the principal responsibility for selecting goals and objectives. In reaching these decisions, parents should be furnished with as much relevant information as possible, including a description of all available alternatives. In cases where professional members of the team seriously question the soundness of a parental decision on the basis that it is not in the best interests of the retarded client, the matter should be referred to an independent committee charged with review of ethical and legal issues. The establishment, composition, and functions of such committees have been described in detail (AAMD, 1975; May et al, 1975; Wyatt v. Stickney, 1972), and they are now commonly assigned to programs and facilities serving retarded clients.

Since clear communication is vital to meaningful interaction between parents and professionals, professional jargon should be minimized. Reports should be presented using everyday language rather than specialized technical terminology, and when technical concepts are inescapable (e.g., "I.Q.," "hydrocephalus," "timeout"), their meaning should be clarified in operational terms.

Parents often need support and encouragement as they struggle to cope with the problems and frustrations of raising a retarded child. Professionals can be extremely helpful by systematically reinforcing parents' efforts and furnishing parents with positive feedback regarding their child's progress. Letting parents know that professionals recognize that parents are facing difficult situations can also prove to be highly supportive.

Professionals should guard against entering into covert competition with parents. They need to be constantly aware of the possibility of entering into such competitive rivalries and of the temptation to use parents as scapegoats or to undermine parental efforts with their retarded child.

General Principles

Since parents of retarded children differ considerably from each other in almost any dimension, it would be inaccurate to claim that they all concur on some general principles for serving the mentally retarded. Nonetheless, NARC has succeeded in promulgating general policy statements and in advocating implementation of several basic principles through such diverse avenues as legislation, federal regulations, national standards, and court decisions. Although these principles are not necessarily subscribed to by all members of the association, nor by all parents of retarded children, they do reflect values generally held by many such parents (Roos, 1975b).

Developmental Programming

First proposed as an alternative to destructive stereotypes of mental retardation by Wolfensberger (1969), the developmental model of mental retardation was subsequently operationally defined and applied to programmatic and administrative issues (Roos, McCann, and Patterson, 1971; Roos, 1972.) It has since been widely adopted as a sound basis for programming for handicapped individuals and it has been incorporated in national standards (e.g., Joint Commission on Accreditation of Hospitals, 1973) and court decisions (e.g., Wyatt v. Stickney, 1972).

The developmental approach to programming is predicated on the assumptions that (a) all human

beings are in a constant state of change, (b) they change in predictable, sequential ways, in compliance with specific stages, and (c) environmental variables exert a potent influence on the rate and direction of individual development. All human beings are considered to be malleable and to have potential for growth and development, no matter how seriously handicapped they might be.

Three fundamental criteria were proposed by Roos et al (1971) as the basis for selecting program goals. Programs should increase the complexity of the client's behavior, increase the client's capacity to cope with his/her environment, and enhance the client's human qualities, as culturally defined.

Normalization

When first enunciated by Nirje (1969), the principle of normalization referred to ". . . making available to the mentally retarded patterns and conditions of everyday life which are as close as possible to the norms and patterns of the mainstream of society" (p. 181). This concept referred to a process rather than to a goal or objective, but subsequently Wolfensberger (1972) expanded the principle to include both process and goal by defining normalization as "utilization of means which are as culturally normative as possible, in order to establish and/or maintain personal behaviors and characteristics which are as culturally normative as possible" (p. 28).

Although it seems safe to assume that normative approaches usually foster normative behavior, this is not necessarily the case. Hence, deviations from normative techniques are warranted to the degree that they prove more successful in reaching developmental goals when applied to specific individuals (Roos et al, 1971).

Individualization

This principle has been defined as "recognizing the uniqueness of each handicapped person and the need to individualize all services to best meet his/her individual needs" (Roos, in press). Inherent in this concept is emphasis on the potential dangers of regimentation and labeling. Regimentation tends to reduce all individuals to the least common denominator and has been particularly destructive in institutional programs designed to handle large groups as efficiently as possible. Labeling not only oversimplifies complex individual situations, but it also tends to generate self-fulfilling and self-limiting prophecies. General recognition of the importance of individualization is now evident in the emphasis on individual program planning contained in national standards, regulations, and court decisions.

Self-Actualization

Borrowing the term from Maslow (1968), Roos (1974) has defined this principle by stating that "each handicapped person should be given the opportunity to determine his/her own course, to shape his/her own destiny. This means that each individual should be given maximum opportunities for making choices among acceptable alternatives" (p. 6). Traditionally, handicapped persons have been restricted in the number of desirable alternatives available to them, and hence their freedom has been curtailed. This restriction in freedom has been partly a function of others (often parents or professionals) making decisions for handicapped individuals, but it has also been a function of environmental conditions. The complex environments in which most of us live are designed for nonhandicapped persons and frequently present serious physical and psychological obstacles to handicapped persons. Modification of the environment is therefore crucial in fostering self-actualization, and must include development of new prosthetic environments designed to allow handicapped persons greater control over their surroundings and hence greater freedom of choice (Bensberg, Colwell, Ellis, Roos, and Watson, 1969; Roos, 1974).

Conclusion

There seems to be enough agreement among parent organizations to warrant summarizing what the majority would currently consider as the most desirable approach to the education of mentally retarded persons. The following are some of the major components of this approach:

All mentally retarded children should be provided appropriate public education.

Education should begin as early in life as possible and continuing education services should be available throughout life to retarded adults.

Education should focus on practical skills which will foster developmental goals.

Normative approaches are to be preferred unless deviations from such approaches prove to be more effective in achieving developmental objectives.

Parents and, when possible, retarded students themselves, should be fully participating members of the educational team, with primary responsibility for deciding on the priority of program objectives.

Every pupil should have an individualized program which is periodically reviewed and appropriately modified.

Each pupil should be given the maximum possible opportunity for making his/her own decisions and shaping his/her own future.

Major strides have been made toward achieving adequate public education for all retarded individuals, yet many critical needs are still unmet. Parents have played a key role in progress to date. As they grow in sophistication and assume an increasingly active involvement as social change agents, they will doubtless contribute even more to the future of handicapped persons.

References

American Association on Mental Deficiency. Position papers of the American Association on Mental Deficiency. Washington: American Association on Mental Deficiency, 1975.

Bensberg, G., Colwell, C., Ellis, R. N., Roos, P., & Watson, L. S. Report on symposium on environmental modifications for the profoundly retarded. Albany, New York: New York State Department of Mental Hygiene, 1969.

Bijou, S. W. Research in remedial guidance of young retarded children with behavior problems which interfere with academic learning and adjustment. Washington: Office of Education, Bureau of Research, ED 024-196, GPO, June, 1968.

Blatt, B., & Kaplan, F. Christmas in purgatory: A photographic essay on mental retardation. Boston, Mass: Allyn and Bacon, 1966.

Blatt, B. Exodus from pandemonium. Boston, Mass: Allyn and Bacon, 1970.

Bloom, B. S. Stability and change in human characteristics. New York: John Wiley and Sons, 1964.

Boggs, E. M. New hope for the retarded. The Rotarian Magazine, July, 1963.

Brophy, J. E. Mothers as teachers of their own preschool children: The influence of socioeconomic status and task structure on teaching capacity. Child Development, 1970, 41, 79-94.

Dybwad, G. Community organizations for the mentally retarded. Columbus, Ohio: National Conference on Social Welfare, 1959.

Felicetti, D. A. Mental health and mental retardation politics. New York: Praeger Publishers, 1975.

Ferritor, D. E. Modifying interaction patterns: An experimental training program for parents of autistic children. Dissertation Abstracts, 1970, 30, 3114-3115.

Friedman, P. R., & Beck, R. L. Mental retardation and the law: A report on status of current court cases. Washington: President's Committee on Mental Retardation, U. S. Department of Health, Education, and Welfare, 1975.

Gray, S. W. Children from three to ten: The early training project. DARCEE Papers and Reports (Vol. 3). Nashville, Tenn.: George Peabody College, 1971.

Gray, S. W., & Klaus, R. A. An experimental preschool program for culturally deprived children. Child Development, 1965, 36, 887-898.

Gray, S. W., & Klaus, R. A. The early training project: The seventh year report. Child Development, 1970, 41, 909-924.

Haywood, H. C. Experimental factors in intellectual development: The concept of dynamic intelligence. In J. Zubin & G. A. Jervis (Eds.). Psychopathology of mental retardation. New York: Grune and Stratton, 1967.

Heber, R., Garber, H., Harrington, S., Hoffman, C., & Falender, C. Rehabilitation of families at risk for mental retardation. Madison, Wisc: University of Wisconsin, 1972.

Hess, R. D., & Shipman, V. C. Early experience and the socialization of cognitive models in children. Child Development, 1965, 36 (4), 869-886.

Hunt, J. McV. Intelligence and experience. New York: Ronald Press, 1961.

Joint Commission on Accreditation of Hospitals. Standards for residential facilities for the mentally retarded. Chicago: Accreditation Council for Facilities for the Mentally Retarded, 1973.

Katz, A. H. Parents of the handicapped. Springfield, Ill.: Thomas, 1961.

Kugel, R. B., & Wolfensberger, W. (Eds.). Changing patterns in residential services for the mentally retarded. Washington: The President's Committee on Mental Retardation, 1969.

Luthernan, D. M. A parent-oriented nursery program for preschool deaf children. Volta Review, 1971, 73, 106-112.

Maslow, A. Toward a psychology of being, (2nd ed.) New York: Van Nostrand Rheinhold, 1968.

May, J. G., Risley, T. R., Twardosz, S., Friedman, P., Bijou, S., & Wexler, D. Guidelines for the use of behavioral procedures in state programs for retarded persons. Arlington, Texas: National Association for Retarded Children, 1975.

Mead, M., & Brown, M. The wagon and the star. Chicago: Rand McNally, 1966.

Mills v. Board of Education of District of Columbia. 348 F. Supp. 866 (D.C.D.C., 1972).

National Association for Retarded Children. Policy statement on residential care. Arlington, Texas: National Association for Retarded Children, 1968.

National Association for Retarded Children. National conference on residential care. Arlington, Texas: National Association for Retarded Children, 1969.

National Association for Retarded Citizens. Policy statements on the education of mentally retarded children. Arlington, Texas: National Association for Retarded Citizens, 1971.

National Association for Retarded Citizens. Residential programming for mentally retarded persons (4 vols.). Arlington, Texas: National Association for Retarded Citizens, 1972.

National Association for Retarded Citizens. The right to choose. Arlington, Texas: National Association for Retarded Citizens. 1973 (a).

National Association for Retarded Citizens. Teacher preparation and certification. Arlington, Texas: National Association for Retarded Citizens, 1973 (b).

National Association for Retarded Citizens. Avenues to change (4 vols.). Arlington, Texas: National Association for Retarded Citizens, 1974 (a).

National Association for Retarded Citizens. Competencies of persons responsible for the classification of mentally retarded individuals. Arlington, Texas: National Association for Retarded Citizens, 1974 (b).

National Association for Retarded Citizens. Public enrollment practices are surveyed. NARC Research News, December 1974 (c), 1-2.

National Association for Retarded Citizens. Educating the 24-hour retarded child. Arlington, Texas: National Association for Retarded Citizens, 1975 (a).

National Association for Retarded Citizens. Proceedings of national conference on housing for the handicapped. Bethesda, Md.: Health and Education Resources, Inc., 1975 (b).

National Association for Retarded Citizens. Resolution on biomedical and pharmacological research on mentally retarded persons in residential facilities. Arlington, Texas: National Association for Retarded Citizens, 1975 (c).

National Association for Retarded Citizens. Vocational and life skills. Arlington, Texas: National Association for Retarded Citizens, 1975 (d).

New York State Association for Retarded Children v. Carey, 393 F. Supp. 715 (E.D.N.Y. 1975).

New York State Association for Retarded Children v. Rockefeller, C.A. No. 72-365 (E.D.N.Y. filed 1972).

Nirje, B. The normalization principle and its human management implications. In R. B. Kugel, & W. Wolfensberger (Eds.). Changing patterns in residential services for the mentally retarded. Washington, DC: The President's Committee on Mental Retardation, 1969.

Olshansky, S. Parent responses to a mentally defective child. Mental Retardation, 1966, 4, 21-23.
Pennsylvania Association for Retarded Children v. Pennsylvania, 343 F. Supp. 279 (E.D. Pa. 1972).

Roos, P. Psychological counseling with parents of retarded children. Mental Retardation, 1963, 1, 345-350.

Roos, P. Parent organizations. In J. Wortis (Ed.), Mental retardation: An annual review (Vol. 3). New York: Grune and Stratton, 1970.

Roos, P. Current issues in the education of mentally retarded persons. In National Association for Retarded Citizens (Eds.), Conference on the education of mentally retarded persons. Arlington, Texas: National Association for Retarded Citizens, 1971.

Roos, P. Mentally retarded citizens: Challenge for the 1970's. Syracuse Law Review, 1972, 23, 1059-1074.

Roos, P. Current trends in mental retardation. Paper presented at the John Umstead Lecture Series. Raleigh, North Carolina, February, 1974.

Roos, P. Parents and families of the mentally retarded. In J. M. Kauffman, & J. S. Payne (Eds.), Mental retardation: Introduction and personal perspectives. New York: Charles E. Merrill Company, 1975 (a).

Roos, P. Remarks. In Bureau of Education for the Handicapped. Proceedings of the conference on research needs related to education of the severely handicapped. Princeton, NJ: Bureau of Education for the Handicapped, U. S. Office of Education, 1975 (b).

Roos, P. Trends in residential institutions for the mentally retarded. In University Council for Educational Administration (Eds.). Trends in Education. Columbus Ohio: University Council for Educational Administration, 1976.

Roos, P. Consumer involvement--Advocacy and the role of private agencies. In Texas Tech R & D Center (Eds.), Interagency approaches to working with the mentally retarded. Lubbock, Texas: Texas Tech R & D Center, in press.

Roos, P., McCann, B., & Patterson, E. G. A developmental model of mental retardation. Arlington, Texas: National Association for Retarded Citizens, 1971.

Salzinger, K., Feldman, R. S., & Portnoy, S. Training parents of brain-injured children in the use of operant-conditioning procedures. Behavior Therapy, 1970, 1, 4-32.

Segal, R. M. Mental retardation and social action: A study of the associations for retarded children as a force for social change. Springfield, Ill.: Charles C. Thomas, 1970.

Smith, D., & Murphy, W. K. A new world for Lori. Mental Retardation in Illinois, 1969, 3, 3-5.

Wahler, R. G. Setting generality: Some specific and general effects of child behavior therapy. Journal of Applied Behavior Analysis 1969, 4, 239-246.

Welsch v. Likins. 373 F. Supp. 485 (U.S.D.Ct., Minn. 1974).

Wiegerink, R. A. A comparative study of the teaching behaviors of advantaged and disadvantaged mothers. Dissertation Abstracts, 1969, 30(A), 3808-3809.

Wildman, P. R. A parent education program for parents of mentally retarded children. Mental Retardation, 1965, 3, 17-19.

Wolfensberger, W. The origin and nature of our institutional models. In R. B. Kugel & W. Wolfensberger (Eds.), Changing patterns of residential services for the mentally retarded. Washington: The President's Committee on Mental Retardation, 1969.

Wolfensberger, W. Normalization. Toronto: National Institute on Mental Retardation, 1972.

Wolfensberger, W., & Zauha, H. Citizen advocacy and protective services for the impaired and handicapped. Toronto: National Institute on Mental Retardation, 1973.

Wyatt v. Stickney, 344 F. Supp. 373 (M.D. Ala. 1972).

THE RIGHTS OF CHILDREN AND THEIR PARENTS

State and federal courts have played an active role in the field of education in the past few years. The result has been a reshaping of the rules that teachers and administrators must live by as they make decisions on the educational future of children. Basically, the many court cases have defined further who is entitled to an education, and the due process to which every child and parent is entitled. Currently, the influence of the judiciary is seen in the modification of state and federal laws and procedures in education.

Basic Rights of Children and Their Parents

All children are entitled to an appropriate education and an education in the least restrictive environment possible.
Parents have the right to appeal a decision made to alter their child's educational program.
Parents have the right to review and use in their appeal all information used by the school to make the decision.
Parents have the right to have a neutral party decide on the most appropriate program for their child.
Parents have the right to have the benefits of a special program specified and evaluated.

Implications for Educators

Educational services must be available to all children regardless of severity of handicap.
A variety of special education services must be available if children are to receive an education that is appropriate and as close to a program of normalization as possible.
To promote understanding, parents should be informed early of difficulties experienced by their children. They should be involved in the planning and evaluation of the special services provided.
Educational decision making must be based on the efforts of an educational team that collects and uses all appropriate information, not on a single test.
Measurable objectives must be set for children receiving special services. The progress of these children must be reported to their parents.

The demands of courts and school laws should not frighten us. They are only saying that every child has the right to "fair play" and an appropriate education in the schools. This is no more than what we would wish for our children.

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BASIC SKILLS FOR DISCUSSING INTERPERSONAL RELATIONS*

1. **Skills in Understanding the Other Person**
   A. Making sure you understand the ideas, information and suggestions of others.

PARAPHRASE: You state the other's idea in your own words or give an example that shows what you think s/he was talking about. A good paraphrase is usually more specific than the original statement.

Example: Sam said, "Joe is unfit to be a principal."
Paraphrase A: "You think he's not right for the job?"
(Too general. If Sam agrees with it, you will not know what he means by "unfit." You have the illusion of understanding.)
Paraphrase B: "You mean that Joe is disorganized?"
(Specific. Sam might answer, "No. Joe is well organized but he doesn't involve others in decision making." Thus, this paraphrase leads to a clarification of the way Sam is using the word "unfit.")

You can get the other person to clarify by asking, "What do you mean?" or by saying, "I don't understand." However, when you paraphrase, you show what your present understanding is. Thus, you enable him/her to address the clarification to the specific misunderstanding you have revealed.

Before you agree or disagree with a remark, you should make sure you understand it. Paraphrase is one way of testing if the remark you are responding to is really the message being sent.

   B. Making sure you understand the feelings of others.

PERCEPTION CHECK: You state what you perceive the other person to be feeling. A good perception check conveys the message, "I want to understand your feelings——is this (a statement of his/her feelings) the way you feel about it?"

Examples:
"Am I right that you feel disappointed that no one commented on your suggestion?"

"Did you feel pushed out of line by what Kim just said?"

"I get the impression you are angry with me. Are you?"

"I'm not sure whether your expression means my comment hurt your feelings, irritated you or confused you."

Note that a perception check identified the other's feelings in some way, "disappointed," or "pushed out of line." It does not express disapproval or approval of the feelings. It merely conveys, "This is how I understand your feelings. Am I accurate?"

*John L. Wallen, Portland, Oregon. 1965 (mimeo)

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Your perception of another person's feelings often results more from what you are feeling, are afraid of, or are wishing than from his/her words, tone, gestures or facial expressions. Thus, if you feel guilty, you may perceive others as angry or accusing toward you. Our inferences about other people's feelings can be, and often are, inaccurate. It is important to check them out. Perception checking responses aim to convey that you want to understand the other as a person (his/her feelings) and help you avoid regrettable actions based on false assumptions of what the other was feeling.

2. **Skills in Helping Others Understand You as a Person**

A. Helping others understand what you are responding to.

BEHAVIOR DESCRIPTION: Your aim is to let others know what behavior you are responding to by describing it clearly and specifically enough that they know what you observed. To do this you describe evidence that can be seen—behavior open to anyone's observation.

You should avoid attributing unfavorable motives, intentions or character traits to others. Restrict yourself to describing specifically what they did.

Examples:

"Bob, you seem to take the opposite of whatever Harry suggests today."

(NOT:
"Bob, you're just trying to show Harry up." This is not a description but an accusation of unfavorable motives.)

"Jim, you've talked more than others on this topic. Several times you cut off others before they had finished."

(NOT:
"Jim, you're too rude!" This names a trait and gives no evidence.)

(NOT:
"Jim, you always want to hog the center of attention!" This imputes an unfavorable motive.)

"Sam, Jane had not finished her statement."

(NOT:
"Sam, you deliberately didn't let Jane finish." The word "deliberately" implies Sam knowingly and intentionally cut her off. All anybody can observe is that he did cut her off.)

To develop skill in describing behavior, you must sharpen your observation of what actually did occur. As you do, you may find many of your conclusions are based less on observable evidence than on your own feelings of irritation, insecurity, or fear. Thus, accusations are usually expressions of feelings.

B. Helping others understand what you are feeling.

DESCRIBING YOUR FEELINGS: You make clear what feelings you are experiencing by naming or identifying them. The statement must refer to "I," "me" or "my," and specify some kind of feeling by name, simile or figure of speech.

Because describing feelings is so often confused with expressing feelings, it is important to make the difference clear.

Expressions of Feeling	*Descriptions of Feeling*
Person blushes but says nothing.	*"I feel embarrassed."* *"I feel pleased."* *"I feel crushed."* *"I feel annoyed."*
Person suddenly becomes silent.	*"I feel angry."* *"I'm worried about this."* *"I feel like I've been slapped."*
"She's a wonderful person!"	*"I'm in love with her."* *"I enjoy her."* *"I respect her abilities."*
"You talk too much!"	*"I'm bored."* *"I want to say something."* *"I feel inferior at how much you know."*
"Shut up!!"	*"I feel hurt by what you said and afraid to hear any more."* *"I feel angry at myself!"* *"I feel angry with you."*
"Can't you ever be on time?"	*"I'm irritated with you that I had to wait so long in the cold!"* *"I've been worried for fear you might have had an accident!"*
"Damn you!!!"	*"I'm furiously angry with you!"* *"I'm worried about you and I wish I didn't have to be!"* *"I like you and resent you at the same time."*
"You shouldn't have bought me such an expensive gift!"	*"I really like it!"* *"I feel obligated to you and resent it."* *"I feel inferior when I think of the cheap present I gave you."*
"Jim, you are too rude and overbearing."	*"Jim, I'm irritated."* *(Behavior description:* *"You keep cutting me off.")*

Feeling is expressed through commands ("Shut up!"), questions ("Why can't you ever be on time?"), accusations or judgements about traits and motives. ("You talk too much!" "She's a wonderful person.") In addition, feelings are expressed without words by blushing, sighing, crying, becoming silent and keeping another waiting. Any expression of feeling may come from a number of different feelings. Thus, expressions of feeling are apt to be misread. Hence the importance of describing your feelings—which is less ambiguous—if you want others to understand accurately.

The aim in describing your feelings is to start a dialogue resulting in an improvement of your relationship. After all, others need to know how you feel if they are to take your feelings into account. Negative feelings are indicator signals that something may be going wrong in a relationship with another person. To ignore negative feelings is similar to ignoring a warning light in an electrical circuit that indicates the circuit is overloaded. Negative feelings are a signal the two of you need to check for misunderstandings and faulty communication. After discussing how each of you sees the situation, you may discover your feelings resulted from a false perception of the situation and motives. In this case, your feelings would probably change. On the other hand, the other person may discover his/her actions are arousing feelings s/he wasn't aware of and s/he may change.

In short, describing your feelings should not be an effort to coerce the other into changing so you won't feel as you do. Rather you report your inner state as one more piece of information necessary if the two of you are to understand and improve your relationship.

THE SEARCH FOR REINFORCERS TO TRAIN AND MAINTAIN EFFECTIVE PARENT BEHAVIORS

Paul Bates

Programs aimed at teaching parents to apply behavioral principles with their children have been increasing steadily within the past 10 years. With the assistance of professionals and trained paraprofessionals, many parents have been taught to implement successfully behavior change programs involving a wide variety of behaviors. The most prevalent behaviors that have been worked with include antisocial and immature behavior; seizures; self-injurious behaviors; speech dysfunction; school phobia; encopresis and enuresis; and oppositional behaviors. (11) In addition to treating problem behaviors, parents have been instructed how to administer reinforcement contingencies systematically to teach their children academic, self-help, and daily living skills.

The purpose of the present article is to discuss techniques available to the parent trainer that utilize behavioral principles to teach behavioral principles. A major deficit of many training programs has been that specific reinforcement contingencies on parent behavior have been frequently omitted.(19) In this article the focus is on identifying possible reinforcement procedures that may be utilized with parents. Procedures will be presented that are applicable to both group training approaches and individualized approaches.

Pretraining Environment

Initially, conditions may be arranged that encourage parents to attend training sessions. All aspects of the parent-professional interaction could be structured to reinforce the parents for their involvement. The following techniques represent professional behaviors that are designed to establish a positive pre-workshop environment:

Personal Invitations to Parents. Any combination of written, telephone, and home visit invitations should increase the chances that parents will choose to attend.

Transportation Assistance. Car pools, bus service, and information regarding transportation routes for the workshop are ways in which the parents can be assisted to arrive for the scheduled instruction sessions.

Location of Workshop. The selection of a location for the training should be based on the convenience for the parents rather than convenience for the professional.

Scheduling of Workshop. Parents should be involved in the selection of dates and times of the sessions. Weekend workshops may be quite popular with professionals but aversive to parents.(20)

Babysitting Service. Volunteer groups or other staff could be utilized to provide babysitting for the parents' children during the training sessions. Babysitting is a necessity for many families' being able to attend. The opportunity to be away from their children for a few hours may be reinforcing in itself and thus increase the chances that the parents will attend the sessions.

In addition to gearing all arrangements for the workshop in such a manner as to encourage as many parents to attend as possible, parents must be reinforced for their actual attendance. Social reinforcement, monetary reinforcers, and extra parent-child services are all reinforcers that might be administered contingent on parents' regular presence at training sessions.

The most common attendance contingent reinforcers reported in the literature involve a monetary deposit by the parents. This deposit is refundable following attendance at the training sessions. (4,9,15,25,30) Rinn and associates (25) compared an attendance-contingent $10 refund group with a noncontingent attendance group and found that the contingent group attended significantly more sessions than the noncontingent group. The first 100-percent parent training attendance was

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reported by Hirsch and Walder, [9] who utilized a $50 attendance-contingent refund. To insure that the reinforcement contingencies for attendance will be effective, it is advisable to involve parents in the determination of these contingencies.

Workshop Reinforcers

Once parents attend the training sessions, a positive workshop training environment should be established. If they are to return for further training sessions and maintain interest in the material, they must be reinforced. Techniques designed to maximize the reinforcing components of the workshop and minimize the aversive are as follows:

Reinforcing Physical Setting. A pleasant location, comfortable chairs, refreshments, and frequent breaks are all techniques designed to make the workshop environment more enjoyable.

Interesting Instructional Format. A variety of books, films, slide shows, participation demonstrations, and so on should be utilized to maintain interest. Furthermore, delivery of the information should be considered equally as important as the content.

Several programmed texts have been written that discuss the basic learning principles in a manner that communicates the information well to a parent audience.[3,22,32] The programmed structure of these texts presents the information in a sequential manner with question-and-answer feedback at the end of each section. Acquisition of this material is reinforced by the immediate feedback of the questions and answers.

Lecture discussions can be arranged so that parents provide much of the content through their answers and comments. With parents providing the answers, these verbal behaviors may be reinforced by the instructor and the group of parents.

Recognized Course Credit. Workshops in affiliation with local continuing adult education programs, colleges, or universities may provide reinforcement for parents through recognized course credit for the completion of the instruction. If such affiliation is not possible or is undesirable, parent trainer certificates developed by the professional may be effective as reinforcers.

Alternatives to Traditional Assessment. Traditional pre-post tests should be avoided due to the potentially aversive components that are usually attached to such testing procedures. Since the trainer wants to decrease aversive aspects of the teaching situation and also to assess the effect of the instruction, an alternative means of evaluation must be devised.

One unique method of assessment that may be used includes incorporating pencil-and-paper tests into a crossword puzzle context. In another program,[2] tokens were used to increase parent feedback through participation in discussions and demonstrations. The high frequency of parental participations (20-an-hour average) provided the instructor with a constant verbal check of the effectiveness of the instructional methods. It should be remembered, however, that these methods are only gauging the appropriate writing and verbal behaviors of the parents.

Direct observation of parent behaviors is perhaps the most desirable evaluation technique. Gardner, Brust, and Watson[8] used a trainer proficiency scale to evaluate acquisition of workshop material. Direct observation evaluations can be effective in that they provide positive experiences for parents as they successively approximate the program objectives. Direct observations can be made with parents role-playing the training procedures, working with the child in a controlled laboratory setting, or in the parents' home where the behaviors will be required. If the balance of the feedback is not positive, this type of evaluation may have adverse effects on acquisition of the behavior principles.

Reinforcers for Participation. Professional or paraprofessional social praise, peer reinforcement from other parents,[12] vicarious reinforcement from observing other parents receiving reinforcers, token reinforcers,[24] and monetary reinforcers are all techniques that have been utilized to increase parental participation in learning behavioral principles. In the initial stages of instruction, reinforcement for participation should be continuous. As parents acquire more skills, the professional

may choose to reinforce selectively responses that approximate the teaching objectives more closely.

Reinforcers for Project Completion. Many programs have included homework assignments such as baseline charting, graphing, and antecedent-behavior-consequence recording as part of the workshop instruction. Completion of these assignments has been reinforced by contingent money refunds,[4,25,30] tokens,[24] the opportunity to consult with the professional,[15,30] and the opportunity to advance in the training program.[21]

Program Implementation Reinforcers

Many parent trainers have been disappointed that the behavior change they are able to effect in their interactions with parents doesn't generalize to the home setting. It should not be surprising that generalization fails to occur since so frequently program efforts have made no systematic plans to program for transfer of training.[1,33] The reinforcement of parents for program implementation is an essential component in planning for generalization of the application of behavioral principles.[13,17,28]

The initial behavior selected for change should reflect a relatively easy behavior to change as well as a behavior reinforcing to the parents. A behavior that is easy to change increases the chances that initial training efforts will be successful. Only if that behavior change is perceived as reinforcing will that success strengthen program implementation behaviors. A great deal of expertise must be exercised in selecting an initial behavior meeting both the above-mentioned criteria. Active involvement of the parents in this selection could be advantageous to the parent trainer. Behaviors more resistant to change could gradually be included into the program until success is achieved at a level that is more satisfactory.

Initially, program implementation may be conducted within controlled laboratory settings where immediate feedback for parents may be provided through cueing lights,[12, 29] bug-in-the-ear auditory cueing,[14, 18] and videotape feedback.[5] Wahler[29] initially used cueing lights as discriminative stimuli for parents to reinforce their child. As the parents began using reinforcement appropriately without the light cue, the light was flashed as a reinforcer for their contingent reinforcement of their child. Bug-in-the-ear cueing made it possible to provide more specific instructions and social reinforcers for the parents. Videotape feedback provides an opportunity for the parent and professional to observe the parent-child interactions together.

Beyond the laboratory setting and into the home, parents may be reinforced for program implementation through telephone communications of encouragement and/or personal visits to the home. Graphing behavior change and displaying this for the family is another potential reinforcer that gives visual feedback as well as a permanent product of behavioral progress. Support services such as babysitting, additional training programs for the child, and social activities can also be arranged as contingent payoffs for program implementation.

Maintenance of Behavior Change

In order to maintain behavior change in the child, the professional must maintain changes in the parent's behavior. The program implementation reinforcers listed in the previous section should be frequent during the initial stages of the program and reduced gradually as parents demonstrate their competence. The parents may receive reinforcement from the change in behavior of their child, but when that behavior change is not occuring in the right direction or as quickly as desired, the parent trainer must provide the reinforcers. Frequent visits and phone calls[10] during this phase of a program may reinforce the consistency that is crucial to success.

One unusual program maintenance system involved the use of fee reductions of one dollar made contingent on the completion and return of program progress notes. This system not only strengthened the parents' program the completion and return of program progress notes.[23] This system not only strengthened the parents' program the program.

Once the amount of involvement with a particular family is decreased, it is desirable to arrange for reinforcers natural to the home setting that can replace the previous reinforcers. Arrangements

should be made for parents and siblings to reinforce each other for program consistency.[27] Specifically, these might involve going out to dinner for mother, a steak dinner for father, and an additional allowance for siblings; these are all possible reinforcers available within the family interaction system.

At this time limited research has been directed toward investigating these post-training contingencies that must maintain behavior change in the parent.[7, 16] In addition to the maintenance reinforcement procedures mentioned previously, peer programming[6, 26, 31] and the instruction of parents in self-monitoring[16] have been suggested as possible effective techniques in achieving program maintenance.

Special Families—Special Approaches

Minority parents, single parents, and mentally retarded parents represent special populations that the professional must be sensitive to. For example, minority parents may be more motivated to learn if the trainer is of the same minority. Single parents may respond well to activity reinforcers and/or free babysitting services that would enable them to socialize more with other persons. Mentally retarded parents may require the trainer to task-analyze all instructional material.

Another special problem area requiring a specialized approach is the lack of participation by both parents in the training. Since the involvement of both parents is a key to program consistency, it is desirable to arrange for both to be active participants. Walder and associates[30] achieved involvement of both parents by making a monetary refund contingent on the participation of both parents. The above-mentioned special techniques are not meant to be exhaustive; they are aimed only at providing some examples of reinforcers that may prove successful.

Discussion and Summary

This article has presented several promising procedures for reinforcing parents. Although several programs have incorporated incentive systems for parents into their framework, few have systematically applied reinforcement contingencies with parents for their acquisition, implementation, and maintenance of their use of behavioral principles. From the establishment of a reinforcing pretraining environment to the arrangement of natural reinforcers to maintain program implementation, reinforcing contingencies should be applied throughout the parents' training.

Results to date indicate that the use of contingent reinforcers for the parents' behavior is effective. Better controlled experiments in more rigorous research designs would more validly demonstrate the utility of these procedures with parent training. If the parent training technology is to mature, variables such as the reinforcement of parents need to be investigated.

List of References

1. Baer, Donald M.; Wolf, Montrose M.; and Risley, Tod R. Some Current Dimensions of Applied Behavior Analysis. J. Applied Behavior Analysis. Spring, 1968. 1:1:91-97.

2. Bates, Paul. Community Transition: A Behavioral Approach with the Severely and Profoundly Retarded and Their Families. AAESPH Rev. To be published.

3. Becker, Wesley C. Parents Are Teachers; a Child Management Program. Champaign, Ill.: Research Press, 1971.

4. Benassi, Victor A., and Benassi, Barbara J. An Approach to Teaching Behavior Modification Principles to Parents. Rehab. Lit. May, 1973. 34:5:134-137.

5. Bernal, M. E., and others. The Use of Videotape Feedback and Operant Learning Principles in Training Parents in Management of Deviant Children. In: Rubin, Richard D., and others, eds. Advances in Behavior Therapy. New York: Academic Press, 1972.

6. Cash, Wanda M., and Evans, Ian M. Training Pre-School Children to Modify Their Retarded Siblings' Behavior. J. Behavior Ther. & Exper. Psychiat. Apr., 1975. 6:1:13-16.

7. Gardner, J. M. Training Parents as Behavior Modifiers. In: Yen, Sherman, and McIntire, Roger, eds. Teaching Behavior Modification. Kalamazoo, Mich.: Behaviordelia, 1976.

8. Gardner, James J.; Brust, Donna J.; and Watson, Luke S., Jr. A Scale To Measure Skill in Applying Behavior Modification Techniques to the Mentally Retarded. Am. J. Mental Deficiency. Mar., 1970. 74:5:633-636.

9. Hirsch, I., and Walder, L. Training Mothers in Groups as Reinforcement Therapists for Their Own Children. Paper presented at the 77th Annual Convention of the American Psychological Association, 1969.

10. Holden, B., and Sulzer-Araroff, B. Schedules of Followup and Their Effect upon the Maintenance of a Prescribed Teaching Program. In: Semb, G., ed. Behavior Analysis and Education——1972. Lawrence, Kan.: University of Kansas, Support and Development Center for Follow Through, Dept. of Human Development, 1972.

11. Johnson, Claudia A., and Katz, Roger C. Using Parents as Change Agents for Their Children: A Review. J. Child Psychol. & Psychiat. Sept., 1973, 14:3:181-200.

12. Johnson, Stephen M., and Brown, Richard A. Producing Behavior Change in Parents of Distrubed Children. J. Child Psychol. & Psychiat. Oct., 1969. 10:2:107-121.

13. Kazdin, Alan E. Behavior Modification in Applied Settings. Homewood, Ill.: Dorsey Press, 1975.

14. Krapfl, Jon E.; Bry, Peter; and Nawas, M. Mike. Uses of the Bug-in-the-Ear in the Modification of Parents' Behavior, p. 31-35, in: Rubin, Richard D., and Franks, Cyril M., eds. Advances in Behavior Therapy. New York: Academic Press, 1969.

15. Liberman, R. P. Applying Behavioral Techniques in a Community Mental Health Center. In: Rubin, Richard D.; Brady, J. P.; and Henderson, J. D., eds. Advances in Behavior Therapy. New York and London: Academic Press, 1973.

16. Loeber, Rolf, and Weisman, R. G. Contingencies of Therapist and Trainer Performance: A Review. Psycholog. Bul. Sept., 1975. 82:5:660-688.

17. Lovaas, O. Ivar, and others. Some Generalization and Follow-Up Measures on Autistic Children in Behavior Therapy. J. Applied Behavior Analysis. Spring, 1973. 6:1:131-166.

18. Moore, Benjamin L., and Bailey, Jon S. Social Punishment in the Modification of a Preschool Child's "Autistic-Like" Behavior with a Mother as Therapist. J. Applied Behavior Analysis. Fall, 1973. 6:3:497-507.

19. O'Dell, Stan. Training Parents in Behavior Modification: A Review. Psycholog. Bul. July, 1974. 81:7:418-433.

20. Pascal, C. E. Using Principles of Behavior Modification To Teach Behavior Modification. Exceptional Children. May, 1976. 42:8:426-430.

21. Patterson, G. R. Behavior Intervention Procedures in the Classroom and in the Home. In: Bergin, Allen E., and Garfield, Sol L., eds. Handbook of Psychotherapy and Behavior Change: An Empirical Analysis. New York: Wiley, 1969.

22. Patterson, Gerald R., and Gullion, M. Elizabeth. Living with Children: New Methods for Parents and Teachers. Champaign, Ill.: Research Press, 1968.

23. Patterson, G. R., and others. Reprogramming the Social Environment. J. Child Psychol. & Psychiat. Dec., 1967. 8:3/4:181-195.

24. Peine, Hermann A., and Munro, Barry C. Behavioral Management of Parent Training Programs. Psycholog. Record. Fall, 1973. 23-4:459-466.

25. Rinn, R. C.; Vernon, J. C.; and Wise, M. J. Training Parents of Behaviorally-Disorder Children in Groups: A Three Years' Program Evaluation. Behavior Ther. May, 1975. 6:3:378-387.

26. Surratt, Paul R.; Ulrich, Roger E.; and Hawkins, Robert P. An Elementary Student as a Behavioral Engineer. Applied Behavior Analysis. Summer, 1969. 2:2:85-92.

27. Wagner, Mervyn K. Parent Therapists: An Operant Conditioning Method. Mental Hygiene. July, 1968. 52:3:452-455.

28. Wahler, Robert G. Setting Generality: Some Specific and General Effects of Child Behavior Therapy. J. Applied Behavior Analysis. Winter, 1969. 2:4:239-246.

29. Wahler, Robert G., and others. Mothers as Behavior Therapists for Their Own Children. Behavior Research & Ther. Spet., 1965. 3:3:113-124.

30. Walder, L. O., and others. Parents as Agents of Behavior Change. In: Golann, Stuart E., and Eisdorfer, Carl, eds. Handbook of Community Mental Health. New York: Appleton-Centruy-Crofts, 1972.

31. Walker, Hill M., and Buckley, Nancy K. Programming Generalization and Maintenance of Treatment Effects Across Time and Across Settings. J. Applied Behavior Analysis. Fall, 1972. 5:3:209-224.

32. Watson, L. S., Jr. Child Behavior Modification: A Manual for Teachers, Nurses and Parents. New York: Pergamon Press, 1973.

33. Wehman, Paul; Abramson, Marty; and Norman, Charles. Transfer of Training in Behavior Modification Programs: An Evaluative Review. J. Special Educ. Summer, 1977. 11:2:217-231.

COMMUNITY SERVICES NECESSARY TO PROGRAM EFFECTIVELY FOR THE SEVERELY/PROFOUNDLY HANDICAPPED

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Few would argue that our institutions for the handicapped have provided so much as humane care, let alone effective training and treatment programs, for their charges. The original purpose of the first institution, to make each resident "... more of a man and less of a brute by patience and kindness directed by energy and skill" (Howe, quoted by Baumeister, 1970), has been subverted over the years, as the number and size of residential centers for the handicapped have increased. With the exception of a minority of individuals for whom the institution represents an improvement in living conditions, the available evidence unequivocally shows that normal home care is more conducive to healthy growth and development than is institutional care (Klaber, 1970). In fact, the overcrowded and sensorily deprived environments in most institutions probably account for much of the bizarre and disturbed behavior exhibited by many institutionalized persons (Kreger, 1971). And Wolfensberger (1971a) has characterized the average public residential facility as "... a de-individualizing residence in which retarded persons are congregated in numbers distinctly larger than might be found in a large family; in which they are highly regimented; in which the physical or social environment aims at a low common denominator; and in which all or most of the transactions of daily life are carried out under one roof, on one campus, or in largely segregated fashion" (p. 15).

The American public seems slow to become aware of its social problems, quick to react vigorously and with outrage when it is made aware of those problems, and unfortunately prone to forgetting quickly, after an initial flurry of effort and action, that the problems still exist. This seems to have been the case with our public residential facilities for the mentally retarded. Although many Americans were aware of the deplorable and inhumane conditions that existed in our institutions for many years, it was not until the late 1960's and early 1970's that these conditions were made public on a national basis. Two of the most significant contributions here were news media accounts of Senator Robert F. Kennedy's reactions to what he witnessed during several visits to different facilities, and Blatt and Kaplan's photographic essay of life in the back wards of five institutions in four different states (Blatt & Kaplan, 1966). A parents' group in Alabama initiated a lawsuit, Wyatt V. Stickney, that led to a landmark decision in which a federal court mandated massive changes and sweeping reforms in a state-supported residential facility. In the professional domain, Wolfensberger (1969; 1971a; 1971b), among others, called for phasing out large residential facilities in favor of community services and programs, and Nirje (1969), Wolfensberger (1972a), and Roos (1970) recommended normalization as a guiding principle in the provision of services for the handicapped. As early as 1963, President Kennedy called for reducing the residential population of our mental hospitals and retardation centers by "hundreds of thousands" over a period of years (Kennedy, 1963), a challenge that ultimately led to a policy of deinstitutionalization, a term first used in a speech by former President Nixon in 1971, as a major goal of our efforts on behalf of the handicapped in the 1970's. A number of federal and state laws were enacted, culminating with the 1975 passage of P.L. 94-142, which sought to improve the quality of life for all handicapped individuals, and to make available community-based alternatives for their care and treatment.

Given this background of public, professional, political, and judicial action, major changes should have been made, and most problems should have been resolved. Unfortunately, although some

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progress is evident, this is not the case. If major changes have been made within institutions, or in the development of community alternatives, it is impossible to discern them. With the exception of a relatively small number of exemplary programs in a few locations, and with the exception of a general upgrading of most of our institutions, life for the severely and profoundly handicapped goes on pretty much as it has for many years.

The public notoriety gained by institutions for the mentally handicapped has had at least one lasting effect, however. Compared with our history of services to the handicapped, we can sense a new durable commitment to better serving the severely and profoundly handicapped, a commitment that we must and can provide them with better services, more effective programs, and improved living conditions. There is no longer any question of whether the lot of the severely and profoundly handicapped will be improved. The only arguments that remain are where, when, how, and at what cost.

Institutional versus Community Services

There are two points of view about where the severely and profoundly handicapped should be served. Some believe that institutions are the only, if not the best, alternative for this group, while others argue that services should be provided to all individuals, irrespective of their level of functioning, in community settings.

It is clear that there is a trend toward serving only the severely and profoundly handicapped in residential settings. In 1968, the severely and profoundly handicapped accounted for 60% of the residents in public residential facilities (Baumeister, 1970). This increased to 63% of the residents in 131 institutions surveyed by the National Association of Superintendents of Public Residential Facilities for the Mentally Retarded (NASPRFMR) in 1972 (Rosen & Callan, Note 1), and to 71% of the residents in 177 public facilities in a 1974 NASPRFMR survey (Scheerenberger, 1976). Although institutional discharges may reflect administrative or legal decisions more than institutional program effectiveness, it is hoped that this trend toward discharging borderline, mildly, and moderately retarded institutional residents reflects an increased ability on the part of our institutions to prepare their less handicapped residents for community living.

It should also be pointed out that many institutions have revised their requirements for admission to exclude all but the severely and profoundly handicapped; that there are more community programs available today for the less severely handicapped than in previous years; that the less severely handicapped are much easier to place and integrate into community settings; and that the parents of less handicapped individuals object less frequently and less strenuously to their discharge than is the case with the severely and profoundly handicapped. If the current trend continues, it will not be long before our public residential facilities are given over completely to the severely and profoundly handicapped.

While there seems to be a general consensus that the moderately, mildly, and borderline handicapped should be served in community settings, many continue to believe——and argue——that institutionalization is the only alternative for the severely and profoundly handicapped. A 1969 conference, sponsored by the National Association for Retarded Children, concluded: *"... that institutions are with us, they are going to continue to be with us and we had better accept the fact that this is one facet in a total program for the retarded"* (National Association for Retarded Children, 1969). This point of view was also expressed in a recent position statement on residential programming prepared by NASPRFMR (1974):

> *... the development of community programming should not be accomplished by sacrificing quality of services for retarded persons requiring residential care. It is not a question of residential or nonresidential programming. Both are essential, and both, in reality, constitute community services. (p. 3)*

Many arguments have been proposed to justify our continued support of institutions for the severely and profoundly handicapped. First, it is sometimes argued that the burden of caring for these individual is so great that we cannot expect parents to be up to the task. The parents of severely and

profoundly handicapped individuals have come to expect institutional services, and they are unwilling to maintain their children in, or reintegrate them back into, their natural homes. After all, it is argued, the state has usurped parental responsibilities for many years, and it is impossible and unfair to terminate such services now. An opposing point of view holds that most parents can--and want to--meet their parental responsibilities in rearing their handicapped children if they are only given the minimal assistance that this requires. Parent education programs, early intervention services, respite care and babysitting services, family subsidies, and the like are proposed as alternatives that most parents would find more acceptable than placing their child in an institution.

Second, we are sometimes told that the handicapped are happiest and best adjusted when they associate only with their "own kind," rather than competing with their more able peers, where they usually experience failure. Institutionalization, according to this view, is the best choice for the severely and profoundly handicapped, because they differ the most from their normal peers. The advocates of community services, on the other hand, argue that the severely and profoundly handicapped benefit more from association with normal individuals of their own age group, and with their parents and other adults, than they do from associating only with others who are similarly handicapped. Institutionalization denies the individual many opportunities to acquire normal behavior patterns through the mechanisms of modeling and imitation. Segregating large numbers of severely and profoundly handicapped individuals in large institutions can only facilitate and prolong retarded behavior.

A third point of view is that the severely and profoundly handicapped are so different from the general population that the public will never accept them into the mainstream of community life. This argument is similar to the previous one, and it is probably based on an honest concern for the welfare of the individuals concerned. But those holding this opinion are more concerned with the detrimental effects of social ostracism than they are with the beneficial effects of segregated living in institutional settings. The proponents of community services believe that community acceptance of the severely and profoundly handicapped is possible, although it will never be a reality until they are integrated into community life. People probably will find it difficult to completely assimilate the severely and profoundly handicapped into society. The process will take time and it will be painful for some. However, the severely and profoundly handicapped will never be accepted into communities as long as they are permanently shuttled to isolated residential centers at an early age.

Fourth, some argue that institutions are not intrinsically bad (after all, even Harvard is a residential institution). It is held that institutions can, if given adequate financial support, become developmentally healthy places for the severely and profoundly handicapped. This argument implies that institutionalization has been deleterious to the handicapped because insufficient resources have prevented the provision of adequate problems and care. Those opposed to institutions, on the other hand, believe that increasing our financial support of institutions will not substantially improve their ability to serve their residents. Institutions, it is argued, have several essential features, among them their separation of the individual from emotional ties with family and friends, their isolation from the mainstream of community life, and the inconsistency found in any group care situation that cannot be rectified with any amount of financial support.

A fifth argument is that the range of medical, psychological, educational, social, and other services required by the severely and profoundly handicapped is so extensive that it is impractical to provide them in the community. The only economically feasible alternative is to centralize such interdisciplinary services in a residential setting. Community services proponents suggest, as an alternative, that generic community services are sufficient for all but extreme cases and, even then, specialized services can be provided at reasonable cost. This suggests that the problem is not so much one of insufficient services as it is one of excluding the severely and profoundly handicapped from services that are already available.

Sixth, some argue that it is generally less expensive to serve large groups in centralized institutions than it is to serve small groups in dispersed community programs. The costs of providing comprehensive programs and services to small groups of severely and profoundly handicapped individuals in a large number of communities are held to be prohibitive. In view of the skyrocketing costs of institutional care, community services advocates claim that community services may be cheaper. The annual per capita costs of residential care in a facility that meets the requirements for

accreditation set forth by the Accreditation Council for Facilities for the Mentally Retarded (1971), for example, are estimated at somewhere between $20,000 and $25,000, excluding the initial capital improvement expenditures that will also be required. It is hard to imagine community services, even those that include residential care, costing this much.

Seventh, some have argued that community services can be, and often are, just as restrictive, just as de-individualizing, and just as segregated as institutional services. Although the individual may be no better off, s/he often is no worse off in an institution than s/he is in the community. This point is made in the NASPRFMR position statement on residential programming (NASPRFMR, 1974), and made even more forcefully in a recent publication commissioned by the American Federation of State, County, and Municipal Employees (Santiesteven, 1975). Most community services advocates would agree that community services may be just as bad as institutional services, and that geographic location alone is no guarantee that a particular residence will provide freedom from unnecessary restrictions, that it will be responsive to individual need, or that it will lead to integration into the mainstream of society. Yet, it is generally held that the opportunities for freedom, individualization, and integration are greater in community settings. All other things being equal, community residences and community programs are more likely to meet the tests of least restrictive environment, individualized treatment and programming, and normalization.

Summation

Although one may wish that it were otherwise, the arguments for and against community services for the severely and profoundly handicapped are likely to be waged for many years to come. It would be far better if a consensus could be reached in favor of one or the other. We should choose between either continuing our efforts toward renewing and reforming our institutions, or redoubling our efforts toward serving all handicapped individuals in community programs. We already have a tremendous financial and philosophical investment in institutions, and it will be very difficult to abandon this investment in favor of community alternatives. However, we simply cannot afford high quality services for some in institutional settings and high quality services for others in community settings. Although financial considerations alone should not determine our efforts on behalf of the handicapped, they must be carefully considered. The resources available to us are already scarce, and we cannot afford to be irresponsible in their allocation. We must either devote our full efforts and energies, and the bulk of our money, to creating effective and humane services in institutions, or we should dismantle our institutions as quickly as possible and allocate those resources to community programs.

The wisdom of rededicating our institutions to serve only the severely and profoundly handicapped must be questioned. We have a tradition in human services that those who have the greatest needs and the most severe handicaps receive the least in the way of services, and the conversion of our institutions to serve only the severely and profoundly handicapped seems to be another example of "the least getting the least" in human services. If community programs are better suited to meet the needs of the mildly and moderately handicapped, why are they not also better equipped to meet the needs of the severely and profoundly handicapped? Are the severely and profoundly handicapped so different that they are immune from the potentially detrimental effects of institutionalization?

Although there is little evidence bearing on this point, it can be suggested there is a direct relationship between one's level of functioning and the detrimental effects that may accrue to him/her as a result of institutionalization. That is, institutionalization may be least likely to harm an individual who possesses superior intellectual and behavioral abilities, and most likely to damage an individual who has intellectual or behavioral handicaps. If this is the case, and I believe that it is, then we have just made another huge error in our human services system. Instead of devoting most of our attention to deinstitutionalizing the mildly and moderately handicapped, we should be seeking to deinstitutionalize the severely and profoundly handicapped. In fact, if our institutions are going to continue to exist, residence in them should be limited to those who have *no* behavioral or intellectual deficiencies.

Arguments and opinions aside, the choice between institutional and community services is difficult, and each person must arrive at his or her own decision. The point of view expressed here is

that community alternatives appear to have greater potential for providing better services and programs, at smaller or equal costs, than do insitutions. If our goal for the severely and profoundly handicapped is the development of normal behavior patterns in normal settings, then community programs must be preferred to institutionalizaton.

According to Scheerenberger (1974), deinstitutionalization consists of three interrelated processes. These processes can be phrased in the form of priorities for the severely and profoundly handicapped. Our first priority should be to prevent the institutionalization of all severely and profoundly handicapped individuals through the provision of community programs and services. Our second priority should be to return as many of those who are currently institutionalized to community life as we can, through the creation of community services that are designed for this purpose. And our third priority should be to provide humane care and improved services for all those who must be retained in their current institutional residences. In keeping with these priorities, the remainder of this article is primarily concerned with community programs and services for severely and profoundly handicapped individuals who are below age 21 and who have, so far as least, escaped institutionalization.

Essential Community Services

General Considerations

The central tenet of this paper is that *all* individuals, irrespective of their level of functioning or the nature of their handicaps, can be served in community settings. Before this goal can be accomplished, however, some drastic revisions in our approach to providing human services will be required.

Our human services industry is not in good condition. All too often, one has the uneasy feeling that, when effective services are provided, it is more accidental than purposeful. The number and variety of agencies, task forces, consortia, bureaus, divisions, sections, authorities, offices, committees, councils, and departments that comprise our human services apparatus at the local, state, and federal levels has made it unresponsive to individual needs and nearly incomprehensible to those who work within it, let alone to the average citizen.

The indirect process of service development and change, in which administrative bureaucracies, judicial systems, and legislative bodies stand as buffers, if not barriers, between the identification of human needs and the delivery of services, makes meaningful change slow at best and, at times, impossible. Interagency and interdisciplinary conflicts consume too much of our collective energies, at the expense of our consumers. Government mandated and government operated services are subject to the vagaries of political, administrative, and judicial processes, with the result that programs come and go in discontinuous fashion. Funding programs are often categorical, serving only certain age groups or certain target populations, with the result that many individuals in need are excluded from services.

We cannot afford to repeat the past and present errors of our human services when it comes to community services for the severely and profoundly handicapped. This is a new endeavor, and we must carefully plan a network of services and a delivery system that does not become overly bureaucraticized and which retains its original commitment to meeting the needs of individual consumers.

Specific Community Services

It seems to be generally agreed that the special and multiple needs of the severely and profoundly handicapped are so extensive and so diverse that they cannot be met by a single service or program. Few would disagree that full services for this population will require a coordinated, multi-component system in which each service component complements the others.

Some service components, however, are more important than others. Three major components are critical to retaining and serving the severely and profoundly handicapped in community settings: (a) early intervention programs; (b) educational services in public schools, beginning no later than age three and lasting at least until age 21; and (c) community residential services for those individuals who

cannot live in their natural homes. The demand for residential placements would be greatly reduced if all severely and profoundly handicapped children had the benefit of early intervention programs to prevent the development of behavioral disabilities, and if parents were assured that their children would have access to a free public school education.

Early Identification and Intervention. Intervention is predicated on identification, and the earlier the identification and intervention, the better (Nielsen, Collins, Meisel, Lowry, Engh, & Johnson, 1975). This being the case, our identification efforts should begin with neonatal screening to identify handicapped and at risk infants. The most commonly used screening methods, the Apgar Scale (Apgar, 1953) and pediatric neurological examinations (Parmalee & Michaelis, 1971; Prechtl & Beintema, 1964) can detect gross abnormalities. They cannot, however, detect somewhat milder forms of dysfunction (Tronick & Brazelton, 1975). Two scales of more recent origin, the Brazelton Neonatal Behavioral Assessment (Tronick & Brazelton, 1975) and the Graham/Rosenblith Neonatal Test (Rosenblith, 1961; 1975) more accurately differentiate between abnormal, at risk, and normal infants.

Besides neonatal screening tests, there are a number of instruments available for screening purposes during infancy and childhood. These include the Developmental Screening Inventory originally developed by Gessell and Amatruda (Knobloch & Pasamanick, 1974), the Denver Developmental Screening Test (Frankenburg & Dodds, 1966), and the Lexington Developmental Scale (United Cerebral Palsy of the Bluegrass, 1973). A comprehensive developmental evaluation, which should be repeated at regular intervals, is indicated whenever an infant is identified as handicapped. There are many scales available for this purpose, the best of which appear to be the Bayley Scales of Infant Development (Bayley, 1969) and the Gessell and Amatruda developmental assessment procedures (Knobloch & Pasamanick, 1974). The identification of handicapping conditions, without appropriate intervention is meaningless, however. As soon as an individual is identified as handicapped, s/he should be placed in an effective early intervention program.

The weight of evidence suggests that the first few years of life are extremely important in determining the course and rate of subsequent development. The manner in which parents structure the infant's environment, and the quantity and quality of their interactions with their children, have substantial effects on later development (Streissguth & Bee, 1972). Depriving infants of social, sensory or maternal stimulation for prolonged periods of time has been shown to have adverse effects on development (Dennis, 1960; Goldfarb, 1955; Spitz, 1946), and Down's syndrome children reared at home fare much better than those reared in institutions (Centerwall & Centerwall, 1960; Stedman & Eichorn, 1964). There is also evidence that at least short-term developmental gains can be obtained through even minimal environmental enrichment and stimulation at an early age (Casler, 1965; Dennis & Sayegh, 1965; White & Castle, 1964), and an early classic study associated long-term gains with a regimen of stimulation, enrichment, and mothering over a prolonged period (Skeels, 1966; Skeels & Dye, 1939). (The terms "maternal" and "mother," as used in this article, do not necessarily refer to a biological parent of the female sex. While the role of the "mother" is critical to development, this role can be fulfilled by a father, sibling, relative, foster parent, or other adult serving in this capacity.)

Beginning with the initiation of the Head Start program in 1965, and continuing through the present day, most of our early intervention efforts have been aimed at the socio-economically disadvantaged or cultural-familial retarded, sometimes with limited success (see Bronfenbrenner, 1974, and White, 1970, for reviews of the efficacy of Head Start) and occasionally with reported dramatic gains (Heber & Garber, 1975). While it is hoped that longitudinal data will eventually show that early intervention programs can prevent or minimize many of the behavioral deficits of severe and profound handicapping conditions, a word of caution is in order. We cannot afford to repeat the history of the Head Start movement, promising more than we can deliver and expecting more than we can achieve, with the result that we have a "period of optimism" followed by a "period of disillusionment" (Caldwell, 1974). However, we can prevent the development of those disabilities that stem from inadequate stimulation and care during the first few years of life.

Stone (1975) and Brassell (1975) have presented cogent arguments for extending our early intervention efforts to the biologically impaired. According to Stone, we should focus our efforts on parent-child relationships because (a) parents are critical as resources and mediators in the transactions between the infant and his/her world; (b) adverse effects are usually noted in cases in which the

quality and quantity of infant-mother interactions are deficient; (c) biologically impaired infants have an even greater need for the mother to assist them in the development of information processing and response systems than do normal infants; and (d) there is sufficient data to indicate that parents who have been taught special training techniques have positive effects on the development of their children. Early intervention efforts should be directed toward developing mutually reinforcing mother-child systems before they are aimed at training the child in specific skill areas. Such systems can facilitate and enrich the transactions that occur between the child and his/her environment, making it more likely that healthy development will occur as a function of specific training efforts. This approach is supported by evidence that negative experiences can alter the course and impede the rate of development, when mothers either cannot or will not provide their children with adequate learning environments (Heber & Garber, 1975). Handicapped infants are more likely to have these negative experiences in the course of their interactions with their mothers (Fraiberg, 1975; Greenberg, 1971). Several programs for developmentally delayed, high-risk, or atypical infants (Cornwell, Lane, & Swanton, 1975; Dunst & Brassell, 1975; Nielsen, et al., 1975), Down's syndrome children (Hayden & Dmitriev, 1975; Rynders & Horrobin, 1975), blind infants (Fraiberg, 1975), and for mixed groups of developmentally delayed and normal infants and toddlers (Bricker & Bricker, 1971, 1972; Londerweidt, 1975) are demonstrating the efficacy of early intervention programs in which parents play an active and important role.

Several features appear to be critical to the success of early intervention programs for the severely and profoundly handicapped. First, it is mandatory that parents be actively involved in all aspects of the intervention process, and that they serve as primary change agents. Not only should parents and professionals enter into partnership, but parents should be the senior partners. Early intervention programs, and indeed all services for the severely and profoundly handicapped, must be responsive to consumer, rather than to professional, needs. This can be accomplished by recognizing that the primary focus of our early intervention efforts should be on the development of mutually reinforcing parent-child relationships, by involving the parents in all diagnostic and developmental evaluations; by responding to parental suggestions and wishes in planning intervention programs; and by seeking to develop parental self-sufficiency in caring for and teaching their own children. It is only through active parent involvement that we can discontinue the dangerous practice of having professionals assume parental responsibilities and that we can assure that early intervention efforts have durable, long-term effects.

Second, because the parent is the primary change agent, most early intervention efforts should be conducted in the home, rather than in clinic, settings. The process of teaching parents specific intervention techniques should be conducted in the natural surroundings of the home where the services will be delivered and the programs conducted, rather than in the artificial surroundings of an office building or a clinic.

Third, parents should participate in groups whenever possible and individually only as often as necessary. There are benefits, both economic (in terms of staff salaries and travel costs) and social (in terms of the dynamics of group membership) that can be obtained through facilitating the development and maintenance of small groups of parents who have the common bond of a severely or profoundly handicapped child.

Fourth, effective programs require interdisciplinary services that should be mediated through a single professional who works with each family. Termed the cross-modality (Crosby, 1976) or transdisciplinary (Nielsen, et al., 1975) model, this approach requires that the professionals involved be secure enough in their own abilities to permit them to release their roles and impart their skills to other professionals. The members of the interdisciplinary team conduct evaluations and make recommendations for programs and services; their recommendations are then carried out by a single professional who works directly with the family. This individual, in turn, should seek to pass these skills along to the parents as quickly as possible, in keeping with the primary goal of parental self-sufficiency. It goes without saying that there are some services that cannot be delivered except by professionally trained individuals. Every effort should be made, however, to keep direct services delivered by professionals at a minimum, through the use of transdisciplinary teamwork.

Fifth, early intervention programs should be guided by a longitudinal, sequenced curriculum that specifies both long-range goals and short-term behavioral objectives that are related to the long-range

goals. The specific activities or experiences being afforded at any point should have a definite relationship both to the long-range objectives of the intervention program and to the child's developmental level.

Sixth, as Rynders and Horrobin (1975) have emphasized, the specific activities in an intervention regimen should have sufficient structure to assure that they will have a positive impact on development, but at the same time be flexible enough to allow the mother to assert her own maternal style. These authors also suggest a number of principles, based on their work with the mothers of Down's syndrome children, that serve as an excellent guide for the provision of home-based intervention services.

Public School Services. In addition to early intervention programs, the severely and profoundly handicapped must have access to public school services if they are to be served in community settings. Termed the "zero exclusion" model (Crowner, 1975; Sontag, 1976), and stipulated by P.L. 94-142 (see Ballard, Nazzaro, & Weintraub, 1976 for a detailed discussion of this legislation), it guarantees a free, public school education to all severely and profoundly handicapped individuals, irrespective of their level of functioning or the nature of their handicap.

The term "public school," as it is used here, refers to neighborhood schools. It does not refer to special schools that serve only handicapped students, nor does it refer to educational services provided at public expense in institutional settings or through contractual arrangements between state or local education agencies and third parties, such as a local Association for Retarded Citizens or United Cerebral Palsy organization. The severely and profoundly handicapped must be able to attend the same public schools that they would attend if they were not handicapped.

Adopting the zero exclusion model presents a number of problems to school administrators, teachers, and parents. The high incidence of physical handicaps among this population has sometimes been used to justify their continued exclusion from neighborhood schools. Most of our school buildings are old, and nearly all of them have architectural barriers that make wheelchair locomotion difficult. Yet someone must be responsible for students in wheelchairs, and to say that this is not the responsibility of public school personnel is only to say that someone else should do the work. Serving a relatively small number of physically handicapped children in a public school is not an insurmountable task. Most school buildings can accommodate wheelchairs through minor modifications that can be made at a reasonable cost. The difficulties of serving a few students in wheelchairs in a public school are minor when they are compared to the problems of serving a large group of nonambulatory individuals in a large residential facility or a special school.

Full-day, five-day-a-week nursery schools are not generally recommended for normally developing children below the age of 18 to 24 months, and severely and profoundly handicapped children should probably not be placed in full-day programs until they are at least three years of age (Knobloch & Pasamanick, 1974). Entry into school should also be preceded by a preschool program that begins at 12 to 24 months of age, in which the children attend school for two or four hours each day, three to four days each week. Nielsen, et al. (1975) suggests that preschools of this type can provide a natural bridge between home-based intervention and entry into full-day school programs, and that they have several other advantages including opportunities for socialization and the acquisition of new behavior through immitation, more intensive intervention that can be provided by parents over extended periods of time, and relief for mothers from the demands of caring for their handicapped children on a full-time basis.

The issue of integrating the severely and profoundly handicapped with their normal age-mates is often raised when it is suggested that they be enrolled in public schools. As a general rule, the severely and profoundly handicapped should be placed in segregated classes only when necessary, and they should be integrated with their normal counterparts whenever possible. Although some segregation is usually required for instructional purposes, at the least these children can be integrated during recreation periods, mealtimes, and non-instructional activities.

It is sometimes felt that the severely and profoundly handicapped will suffer by being compared with more competent students if they are served in integrated classrooms. Although no controlled studies have been reported, there is no evidence that their self-concepts are substantially lowered as a consequence of integration. The potential for the severely and profoundly handicapped to acquire

more normal behavior, and greater public acceptance, through an association with more competent students, outweighs any disadvantages.

It is understandable that some parents object when their normally developing children are integrated with the severely and profoundly handicapped, because they fear that their children may acquire inappropriate or aberrant behavior through "downward imitation." Such imitative behavior was observed in one integrated day care program, but the imitated responses quickly extinguished in the minority of children who exhibited them, presumably because they were not functional and because such behavior was not reinforced by parents or staff members (Vonderweidt, 1975). The evidence suggests that integrated preschool and day care programs result in measurable developmental gains for both handicapped and non-handicapped children (Bricker & Bricker, 1971, 1972, 1973; Vonderweidt, 1975).

The heterogeneity of student ability that stems from integrating severely and profoundly handicapped students with their normal peers also poses instructional problems for teachers. Providing each student with an individualized instructional program that is matched to the student's developmental level becomes much more difficult if the students are extremely heterogeneous. This difficulty can be overcome, however, if each teacher is given adequate paraprofessional assistance and technical consultation; if teacher-pupil ratios are maintained at realistic levels; and if the teacher instructs students in small, developmentally homogeneous groups, rather than individually, whenever possible.

Community Residential Services. The demand for costly residential services would be substantially reduced if all severely and profoundly handicapped students were served in early intervention and public school programs. However, some severely and profoundly handicapped individuals cannot be kept at home (as is also the case with some normal individuals), and residential services must be provided for them.

In large measure, the impetus for community residences stems from the normalization principle (Nirje, 1969; Wolfensberger, 1972a). According to this principle, residential services for the handicapped should be patterned as closely as possible after the norms and patterns of the mainstream of society. Although the handicapped require extraordinary, i.e., abnormal, treatment at times (Throne, 1975), and although the road to normalization is not without some pitfalls (Vitello, 1974), the principle of normalization can still be an important guide for our efforts. If our ultimate goal for the handicapped is normal behavior patterns occurring in normal environments, the former will not be easily obtained in the absence of the latter.

The term "community residential service," refers to any community-based domicile that provides short or long term care on a 24-hour-per-day basis for individuals or for small groups of handicapped persons. Skarnulis (1976) has used the term "alternative living unit" to refer to the variety of community residences that have been successful in serving a wide range of handicapped individuals, including group homes, developmental homes, staffed apartments, cluster apartments, intensive training homes, apartments, duplexes, condominiums, single family homes, foster homes, and so on. With respect to the severely and profoundly handicapped, there are four basic types of community residences that should be made available: respite care services, adoptive home placements, foster care, and group homes.

Respite care refers to provisions for families to obtain brief periods of relief from the continuous care of a handicapped child. In some cases, respite care alone can mean the difference between a child's being retained at home and his/her being institutionalized. Respite care is an especially important service during periods of family stress or crisis. It can also be a means of providing short-term intensive training that is designed to teach specific skills to individual students. Several institutions are currently offering respite care services (Aanes & Whitlock, 1975), although it would be better to offer these services in community facilities or homes where they would be more accessible to the families requiring them.

If a severely or profoundly handicapped child cannot be retained in his/her natural home, adoptive placement is the preferred alternative. Until recently, most handicapped children were considered unadoptable. Fortunately, this has changed in recent years, as the number of children available for adoption has decreased and as public attitudes towards the handicapped have improved.

In many cases, foster placements eventually result in adoption, after the foster parents have accepted the handicapped child into their family. The Child Welfare League of America operates the Adoption Resource Exchange, a clearing house for placing children who are available for adoption, including handicapped children, in appropriate homes. Since 1968, some 1,400 "hard to adopt" children have been placed in adoptive homes through this one program (Soeffing, 1975). Adoptive placements for the severely and profoundly handicapped are difficult to obtain. They would be easier to locate, however, if the potential parents could be assured of effective educational programs in public schools, and if subsidy payments were available to reimburse them for excess costs (for example medical expenses) which they incurred because of the child's handicap.

We have also seen a dramatic increase in the availability of foster homes for handicapped children in the past few years. Project MEMPHIS (Quick, Little, & Campbell, 1973) and the Macomb-Oakland family care training program (Rosen, Note 2) are two examples of foster home programs that also provide for home-based education and training. In Project MEMPHIS, children ranging in age from birth through five are placed, at the earliest possible time, with foster parents who are paid for their services. The children and their foster mothers are seen twice each week, and individualized lesson plans that are implemented in the foster homes are developed on the basis of extensive assessment data. One of the primary objectives of project MEMPHIS is to intervene early, so that the foster child will be more likely to be adopted by his/her foster family. In the Macomb-Oakland program, foster parents are selected and trained to provide care and training services for handicapped individuals. In addition to receiving payment for residential care and services, the "family care managers" are paid additional, but modest, stipends for providing two hours of daily active instruction for their foster children.

Community group homes should be available for all severely and profoundly handicapped children who cannot be kept in their natural homes and for whom adoptive or foster care placements are not possible. In keeping with the general trend toward community services for the handicapped, there has been an increasing emphasis on group homes in recent years. O'Connor and Sitkei (1975) surveyed 611 facilities that provided services to small groups of "...mentally retarded and/or otherwise developmentally disabled persons who are presently or potentially capable of functioning in the community with some degree of independence" (p. 35). They found that 75% of the facilities surveyed had been in existence for less than five years and that 46% of them had been operating for less than two years. The majority of the residents (89%) served were mentally retarded, and about one-half had been transferred to their community homes from institutions. Although O'Connor and Sitkei do not present data on this point, it can be assumed that few of the residences served severely or profoundly handicapped clients. At least two group homes have successfully served these individuals, however. Martin and Lowther (1973) have reported that substantial behavioral gains were made by a group of formerly institutionalized severely and profoundly retarded girls after they were transferred to a group home, and Favell, Larsen, Sellers, Boyd, St. Clair, Fleeman, and Jackson (1976) have presented data indicating that five severely retarded boys, who were transferred from an institution to a group home, made substantially greater gains on both standardized and criterion-referenced measures than did a matched contrast group that was retained in the institutional setting.

A recent bibliography of printed and audiovisual materials (Council for Exceptional Children, 1975) lists many resources that are available to agencies and organizations involved in community residential services development. Two additional publications, by Patterson & Byrne (1973) and by Behavior Analysis Research Associates (undated), are especially helpful in providing step-by-step instructions for planning and operating community group homes. All of the problems that are encountered in developing community residences for any handicapped group (for example zoning restrictions, transportation, fire and safety codes, community acceptance, employment and training of houseparents, and funding) are compounded in residences for the severely and profoundly handicapped. Yet the success of group homes for less severely handicapped individuals indicates that these obstacles can be overcome.

Other Community Services

There are three additional service components that should be available to support the retention

of the severely and profoundly handicapped in community settings. These components——family counseling, in-home services, and protective services—— should provide whatever support and assistance are required for parents to retain their handicapped children in their natural homes.

Family Counseling. Using a broad definition of the term "counseling," Townsend and Flanagan (1976) have described an in-home pre-admissions program consisting of: (a) instruction in child-training procedures; (b) discussions of available community resources; and (c) counseling about attitudes towards mental retardation, the needs of the child, child-rearing, and homemaking. This program tended to improve the chances that severely and profoundly retarded children would be kept at home. According to these authors, counseling with the mother alone tends to increase marital conflict——a problem that may be minimized by working with both parents or with the entire family. The instruction that they provided in child-training procedures effectively reduced the frequency of objectionable child behavior, and this also tended to induce a decision to keep the child at home. In a 10-week group counseling program, Lewis (1972) obtained significant improvements in both parental attitudes toward their handicapped children and in parental knowledge about mental retardation. The results of these two studies suggest that counseling and related services can improve parental attitudes and reduce the likelihood of institutional placement.

In-Home Services. Skarnulis (1976) has proposed a number of in-home family support services which can make it much easier for a parent to care for a severely or profoundly handicapped child. In the area of material options, he suggests providing: (a) appliances or equipment that eliminate architectural barriers for physically handicapped children; (b) time-saving appliances, such as dishwashers, laundry equipment, and transportation, that would make it possible for parents to devote more of their energies to caring for their children; and (c) medical and behavior modification equipment, such as oxygen tents when they are needed, alarm systems to alert the parents when their child is in need of something or wandering, and special toilet-training apparatus. Skarnulis also lists a number of staff services that could be made available, including: (a) parent support employees to assume some household and child care duties; (b) home handyman services, to make household repairs and construct specialized equipment for child care and training purposes; and (c) skilled babysitting services.

Protective services. Protective services, of which advocacy is the most common form, are required whenever an individual is unable to manage his/her own affairs, and whenever the services available to him/her are qualitatively or quantitatively deficient. In many respects, protective services are responses to deficiencies in our human services system——more often than not, they are needed to protect the individual consumer from the very agencies and institutions that were created to serve his/her needs. There are three major forms of protective services, including operational advocacy, personal or case advocacy, and legal advocacy, all of which seek to make human services responsive to human needs.

Operational advocacy can be defined as the presence of a system for delivering human services that focuses on: (a) ease of access to services at the local level; (b) delivery of full preventive and remedial services to all who need them; and (c) the provision of consumer-oriented, rather than institutionally-oriented, services (Lourie, 1975). Operational advocacy seems to be what the Joint Commission on Mental Health of Children (1969) had in mind when it recommended a nationwide, four-level advocacy system to cover the entire human services apparatus. The closest we have come to developing a functional operational advocacy system is in the Eastern Nebraska Community Office of Retardation (ENCOR) program, which provides comprehensive community-based services to all mentally handicapped individuals in a five-county region of Nebraska (Barker, 1971).

Personal or case advocacy is the most common approach to protective services. A number of models, including citizen advocacy (Wolfensberger, 1972b), child advocacy, and the European educateur (Linton, 1971), exemplify its essential features. These models have in common that they: (a) serve individual consumers who are unable to represent their own interests, (b) make provisions for meeting the expressive needs of the individuals that they serve, (c) assure that the individual contacts and is served by appropriate services, (d) protect the individual's human and civil rights, and (e) provide the individual with continuity across time and services.

Legal advocacy covers any activity that seeks to obtain needed services, when such activities involve making or interpreting laws through legislative action, court decision, or administrative rule-making. It has become the single most important form of protective services, as witnessed by a recent report on the status of current court cases (President's Committee on Mental Retardation, 1975) which reviews 104 pending lawsuits that concern architectural barriers, classification, commitment, custody, education, employment, guardianship, protection from harm, sterilization, treatment, voting, and zoning.

Conclusion

If there is a final solution to the problem of serving the severely and profoundly handicapped, it is to be found only in maintaining the vast majority of these individuals in their natural homes. The astronomical costs of inadequate care and treatment in large residential centers makes it clear that institutions are not an acceptable alternative, on either programmatic or financial grounds.

We should seek to abandon our institutions at the earliest possible time, not by dumping those who currently reside within them into "mini-institutions" that are even worse, but by preventing the admission of any more handicapped individuals to them. We have failed to adequately care for and serve the severely and profoundly handicapped who are already in our institutions, and we cannot give them back the years that we have taken from them or the opportunities that we have caused them to lose. It is within our power, however, to assure that we do not repeat these same errors with younger--and future--generations of severely and profoundly handicapped children.

This is not to say that we can forget the obligation that we have to those who are currently residing in our institutions. It is within our financial and technical resources to provide them with at least humane care and treatment. This can be accomplished at the same time that we create the community programs and services that are necessary to prevent the institutionalization of any more handicapped individuals.

The task of serving all severely and profoundly handicapped individuals in community settings is not insurmountable. In fact, community services for this group will be neither more expensive nor more difficult to provide than it would be to maintain our current fragmented and ineffectual service system for this group. We should begin by basing our services and programs on a firm commitment to our consumers, and by creating a network of services that is aimed at meeting the special needs of the severely and profoundly handicapped individuals rather than meeting our own needs or the needs of our institutions or agencies. If we are to be successful, this is where we will have to start.

The specific community services that are required for the severely and profoundly handicapped do not have to be constructed from nothing. There are a number of exemplary programs throughout the country that have demonstrated the efficacy of early identification and intervention, public school programming, and community residential services that can guide us in this task. These model programs can be adapted to and emulated by other states and regions to create comprehensive and effective services in community settings. To date, not a single state nor region has developed a service network that uses the knowledge and technology that is already available. With your help, perhaps your state will be the first to accomplish this important task.

Reference Notes

1. *Rosen, D., & Callan, L. B. Trends: Residential services for the mentally retarded. Unpublished manuscript. Sterling Heights, Michigan: Macomb-Oakland Center, 1973.*
2. *Rosen, D. Family care training program. Unpublished manuscript. Sterling Heights, Michigan: Macomb-Oakland Center, undated.*

References

Aanes, D., & Whitlock, A. A parental relief program for the MR. Mental Retardation, 1975, 13(3), 36-38.

Accreditation Council for Facilities for the Mentally Retarded. Standards for residential facilities for the mentally retarded. Chicago: Joint Commission on Accreditation of Hospitals, 1971.

Apgar, V. A proposal for a new method of evaluation of the newborn infant. Current Researches in Anesthesia and Analgesia, July--August 1953, 260-267.

Ballard, J., Nazzaro, J. N., & Weintraub, F. J. P. L. 94-142, The Education for All Handicapped Children Act of 1975. Reston, Va: Council for Exceptional Children, 1976.

Barker, E. Current and significant: ENCOR--A community's alternative to institutionalization. Education and Training of the Mentally Retarded, 1971, 6(4), 185-190.

Baumeister, A. A. The American residential institution: Its history and character. In A. A. Baumeister & E. Butterfield (Eds.). Residential facilities for the mentally retarded. Chicago: Aldine Publishing Company, 1970.

Bayley, N. Bayley scales of infant development. New York: The Psychological Corporation, 1969.

Behavior Analysis Research Associates. An operating manual for group living homes. Tallahassee, Fl: Florida Division of Retardation, undated.

Blatt, B., & Kaplan, F. Christmas in Purgatory: A photographic essay on mental retardation. Boston: Allyn & Bacon, 1966.

Brassell, W. R. The case for very early intervention. North Carolina Journal of Mental Health, 1975, 7(3), 10-21.

Bricker, D., & Bricker, W. Toddler research and intervention project report--Year I. IMRID Behavioral Science Monograph. No. 20. Nashville, Tn: George Peabody College, 1971.

Bricker, D., & Bricker, W. Toddler research and intervention project report--Year II. IMRID Behavioral Science Monograph, No. 21. Nashville, Tn: George Peabody College, 1972.

Bricker, D., & Bricker, W. Infant, toddler, and preschool research and intervention project. IMRID Behavioral Science Monograph, No. 23. Nashville, Tn: George Peabody College, 1973.

Bronfenbrenner, U. Is early intervention effective? In B. Friedlander, G. Sterritt, & G. Kirk (Eds.). Exceptional infant, Volume 3: Assessment and intervention. New York: Brunner/Mazel, 1975.

Caldwell, B. M. A decade of early intervention programs: What e have learned. American Journal of Orthopsychiatry, 1974, 44(4), 491-496.

Casler, L. The effects of extra tactile stimulation on a group of institutionalized infants. Genetic Psychology Monographs, 1965, 71, 137-175.

Centerwall, S., & Centerwall, W. A study of children with mongolism reared in the home compared to those reared away from the home. Pediatrics, 1960, 25, 678-685.

Cornwell, S. O., Lane, A. B., & Swanton, C. H. A home-centered, regional program for developmentally impaired infants and toddlers: The first years. North Carolina Journal of Mental Health, 1975, 7(3), 56-65.

Council for Exceptional Children. Reintegrating mentally retarded people into the community. Reston, Va: Author, 1975.

Crosby, K. G. Essentials of active programming. Mental Retardation, 1976, 14(2), 3-9.

Crowner, T. T. A public school program for severely and profoundly handicapped students: Zero exclusion. In L. Brown, T. Crowner, W. Williams, & R. York (Eds.) Madison's alternative for zero exclusion: A book of readings, Madison Wis: Madison Public Schools, 1975.

Dennis, W. Causes of retardation among institutional children: Iran. Journal of Genetic Psychology, 1960, 96, 47-59.

Dennis, W., & Sayegh, Y. The effects of supplementary experience upon the development of infants in institutions, Child Development, 1965, 36, 81-90.

Dunst, C., & Brassell, W. R. The utility of Piaget's concept of decalage for the construction of cognitively-based infant curricula. North Carolina Journal of Mental Health, 1975, 7(3), 22-31.

Favell, J. E., Larsen, L. A., Sellers, V., Boyd, L., St. Clair, J. Fleeman, G., & Jackson, L. Belvedere House: A group home program for severely retarded boys. Paper presented at the annual meeting of the American Association on Mental Deficiency, Chicago, June 1976.

Fraiberg, S. Intervention in infancy: A program for blind infants. In B. Z. Friedlander, G. M. Sterritt, & G. E. Kirk (Eds.). Exceptional infant, Volume 3: Assessment and intervention. New York: Brunner/Mazel, 1975.

Frankenburg, W. K., & Dodds, J. B. Denver developmental screening test. Denver: University of Colorado Medical Center, 1966.

Goldfarb, W. Emotional and intellectual consequences of psychological deprivation in infancy: A

reevaluation. In P. H. Hoch & J. Zubin (Eds.). Childhood psychopathology. New York: Grune & Stratton, 1975.

Greenberg, H. A. A comparison of infant-mother interactional behavior in infants with atypical behavior and normal infants. In J. Hellmuth (Ed.). The exceptional infant, Volume 2: Studies in abnormalities. New York: Brunner/Mazel, 1971.

Hayden, A. H., & Dmitriev, V. The multidisciplinary preschool program for Down's syndrome children at the University of Washington Model Preschool Center. In B. Z. Friedlander, G. M. Sterritt, & G. E. Kirk (Eds.). Exceptional infant, Volume 3: Assessment and intervention. New York: Brunner/Mazel, 1975.

Heber, R., & Garber, H. The Milwaukee project: A study of the use of family intervention to prevent cultural-familial mental retardation. In B. Friedlander, G. Sterritt, & G. Kirk (Eds.). Exceptional infant, Volume 3: Assessment and intervention. New York: Brunner /Mazel, 1975.

Howe, S. G. Report made to the legislature of Massachusetts upon idiocy. Boston: Collidge & Wiley, 1848.

Joint Commission on Mental Health of Children. Crisis in child mental health: Challenge for the 1970's. New York: Harper & Row, 1969.

Kennedy, J. Message from the president of the United States. Washington, D.C.: House of Representatives (88th Congress), Document No. 58, 1963.

Klaber, M. M. Institutional programming and research: A vital partnership. In A. A. Baumeister & E. Butterfield (Eds.). Residential facilities for the mentally retarded. Chicago: Aldine Publishing Company, 1970.

Knobloch, H., & Pasamanick, B. (Eds.). Gessell and Amatruda's developmental diagnosis. Hagerstown, Md: Harper & Row, 1974.

Kreger, K. C. Compensatory environment programming for the severely retarded behaviorally disturbed. Mental Retardation, 1971, 9(4), 29-33.

Lewis, J. Effects of a group procedure with parents of MR children. Mental Retardation, 1972 10(6), 14-15.

Linton, T. E. The European Educateur model: An alternative and effective approach to the mental health of children. Journal of Special Education, 1971, 3(4), 319-327.

Lourie, N. V. Operational advocacy: Objectives and obstacles. In I. N. Berlin (Ed.) Advocacy and child mental health. New York: Brunner/Mazel, 1975.

Martin, G. L., & Lowther, G. H. Kin Kare: A community residence program for severe and profound retardates in a large institution. Paper presented at the International Symposium on Behavior Modification, Minneapolis, October, 1972.

National Association for Retarded Children. Final report of the National Conference on Residential Care (Houston, Texas, July 1969). New York: National Association for Retarded Children, 1969.

National Association of Superintendents of Public Residential Facilities for the Mentally Retarded. Residential programming. Washington, D.C.: President's Committee on Mental Retardation, 1974.

Nielsen, G., Collins, S., Meisel, J., Lowry, M., Engh, H., & Johnson, D. An intervention program for atypical infants. In B. Friedlander, G. Sterritt, & G. Kirk (Eds.). Exceptional infant, Volume 3: Assessment and intervention. New York: Brunner/Mazel, 1975.

Nirje, B. The normalization principle and its human management implications. In R. Kugel & W. Wolfensberger (Eds.). Changing patterns of residential services for the mentally retarded. Washington, D.C.: President's Committee on Mental Retardation, 1969.

O'Connor, G., & Sitkei, E. G. Study of a new frontier in community services: Residential facilities for the developmentally disabled. Mental Retardation, 1975, 13(4), 35-39.

Patterson, G., & Byrne, R. (Eds). The right to choose: Achieving residential alternatives in the community. Arlington, Tx: National Association for Retarded Citizens, 1973.

Parmalee, A. H., & Michaelis, R. Neurological examination of the newborn. In J. Hellmuth (Ed.). Exceptional infant, Volume 2: Studies in abnormalities. New York: Brunner/Mazel, 1971.

Prechtl, H., & Beintema, O. The neurological examination of the full term newborn infant. London: Wm. Heinemann, 1964.

President's Committee on Mental Retardation. Mental retardation and the law: A report on status of

current court cases (DHEW Publication No. 76-21012). Washington, D.C: Author, 1975.
Quick, A. D., Little, T. L., & Campbell, A. A. Early childhood education for exceptional foster children and training of foster parents. Exceptional Children, 1973, 40(3), 206-208.
Roos, P. Normalization, de-humanization, and conditioning: Conflict or harmony? Mental Retardation, 8(4), 12-14.
Rosenblith, J. F. The modified Graham behavior test for neonates: Test-retest reliability, normative data and hypotheses for future work. Biology of the Neonate, 1961, 3, 174-192.
Rosenblith, J. Prognostic value of neonatal behavioral tests. In B. Friedlander, G. Sterritt, & G. Kirk (Eds.). Exceptional infant, Volume 3: Assessment and intervention. New York: Brunner/Mazel, 1975.
Rynders, J. E., & Horrobin, J. M. Project EDGE: The University of Minnesota's communication stimulation program for Down's syndrome infants. In B. Friedlander, G. Sterritt, & G. Kirk (Eds.). Exceptional infant, Volume 3: Assessment and intervention. New York: Brunner/Mazel, 1975.
Santiestevan, H. Out of their beds and into the streets. Washington, D.C: American Federation of State, County, and Municipal Employees, 1975.
Scheerenberger, R. C. A model for deinstitutionalization. Mental Retardation, 1974, 12(6), 3-7.
Scheerenberger, R. C. A study of public residential facilities. Mental Retardation, 1976, 14(1), 32-35.
Skarnulis, E. Less restrictive alternatives in residential services. AAESPH Review, 1976, 1(3), 40-84.
Skeels, H. M. Adult status of children from contrasting early life experiences. Monographs of the Society for Research in Child Development, 1966, 31, Serial No. 105.
Skeels, H. M. & Dye, H. B. A study of the effects of differential stimulation on mentally retarded children. Proceedings and addresses of the American Association on Mental Deficiency, 1939, 44, 114-136.
Soeffing, M. Families for handicapped children: Foster and adoptive placement programs. Exceptional Children, 1975, 41(8), 537-543.
Sontag, E. Zero exclusion: Rhetoric no longer. AAESPH Review, 1966, 1(3), 105-114.
Spitz, R. A. Hospitalism: A follow-up report. Psychoanalytic Study of the Child, 1946, 2, 113-117.
Stedman, D., & Eichorn, D. A. A comparison of the growth and development of institutionalized and home-reared mongoloids during infancy and early childhood. American Journal of Mental Deficiency, 1964, 69, 391-401.
Stone, N. A plea for early intervention. Mental Retardation, 1975, 13(5), 16-18.
Streissguth, A. P., & Bee, H. L. Mother-child interactions and cognitive development in children. In W. W. Hartup (Ed.). The young child: Reviews of research (Volume 2). Washington, D.C: National Association for the Education of Young Children, 1972.
Throne, J. M. Normalization through the normalization principle. Mental Retardation, 1975, 13(5), 23-25.
Townsend, P. W., & Flanagan, J. J. Experimental pre-admission program to encourage home care for severely and profoundly retarded children. American Journal of Mental Deficiency, 1976, 80(5), 562-569.
Tronick, E., & Brazelton, T. B. Clinical uses of the Brazelton Neonatal Behavioral Assessment. In B. Friedlander, G. Sterritt, & G. Kirk (Eds.). Exceptional infant, Volume 3: Assessment and intervention. New York: Brunner/Mazel, 1975.
United Cerebral Palsy of the Bluegrass. The Lexington developmental scale. Lexington, Kentucky: Author, 1973.
Vitello, S. J. Cautions on the road to normalization. Mental Retardation, 1974, 12(5), 39-40.
Vonderweidt, J. A developmentally integrated day care center: A new concept in early intervention. North Carolina Journal of Mental Health, 1974, 7(3), 32-40.
White, B. L., & Castle, P. W. Visual exploratory behavior following postnatal handling of human infants. Perceptual Motor Skills, 1964, 18, 497-502.
White, S. H. The national impact study of head start. In J. Hellmuth (Ed.). Disadvantaged child, Volume 3: Compensatory education, a national debate. New York: Brunner/Mazel, 1970.
Wolfensberger, W. Twenty predictions about the future of residential services in mental retardation. Mental Retardation, 1969, 6(7), 51-54.

Wolfensberger, W. Will there always be an institution? I: The impact of epidemiological trends. Mental Retardation, 1971, 9(5), 14-20(a).

Wolfensberger, W. Will there always be an institution? II: The impact of new service models. Mental Retardation, 1971, 9(6), 31-37(b).

Wolfensberger, W. The principle of normalization in human services. Toronto: National Institute on Mental Retardation, 1972(a).

Wolfensberger, W. Citizen advocacy. (DHEW Publication No. OS 72-42). Washington, D.C: President's Committee on Mental Retardation, 1972(b).

Pretest with Key

PRETEST

1. List a minimum of five reasons why a family involvement program is important to the educational experience of the severely handicapped.

2. Identify and describe four components that you would include in a comprehensive family education program.

3. Identify three advantages of working with families in groups as opposed to individual consultation.

4. Identify and describe at least five areas which should be included in a total family assessment.

PRETEST

Answer Key

1. Refer I. A. Notes 1a through 1f for list of reasons.

2. MR and child development, social learning, community resources, and legal information. (See I. A. Notes 6a).

3. Economical, variety of peer models, group reinforcement opportunities, potential self help function of group (See I. A. Notes 8a).

4. Personal interview, telephone communication, questionnaires, direct observation, audio and videotaping, or written tests. (See I. A. Notes 16a through 16g).

Post-test with Key

POST TEST

1. Provide a response to a parent who refuses to use reinforcement because "it is bribery."

2. Describe the components that are necessary in explaining how to implement timeout to a parent.

3. Describe the essential ingredients of a contingency contract.

4. Identify and describe five community resources that should be available to families of the severely handicapped.

5. Identify and describe three legal issues that have importance for educators and families of the severely handicapped.

POST TEST

Answer Key

1. According to the dictionary bribery refers to payment for wrongdoing. When we talk about using reinforcers with children we are referring to incentives for positive behaviors. (Refer to I. A. Notes 23a through 23e for other responses).

2. Refer to I. A. Notes 25d.

3. Refer to Activity 27 (revised).

4. Educational, medical, residential, recreational, transportation, religious, dental, insurance, restaurants, social, and cosmetic. (Refer to Activity 36 and associated article).

5. Refer to Activity 41.

Bibliography

Selected References - Parent Training

Allen, K. E., & Harris, F. R. Elimination of a child's excessive scratching by training the mother in reinforcement procedures. Behavior Research and Therapy, 1966, 4, 79-84.

Arnold, J. E., Levine, A. G., & Patterson, G. R. Changes in sibling behavior following family intervention. Journal of Counseling and Clinical Psychology, 1975, 45, 683-688.

Ayllon, T., & Roberts, M. D. Mothers as educators for their children. In T. Thompson, and W. Dockens (Eds.), Applications of behavior modification. New York: Academic Press, 1975.

Barrett, B. J. Behavior modification in the home: Parents adapt laboratory-developed tactics to bowel-train a 5 1/2-year-old. Psychotherapy; Theory, Research and Practice, 1969, 6, 172-176.

Benassi, V. A. & Benassi, B. J. An approach to teaching behavior modification principles to parents. Rehabilitation Literature, 1973, 34(5), 134-137.

Bernal, M. E. Training parents in child management. In R. H. Bradfield (Ed.), Behavior modification of learning disabilities. San Rafael, California: Academic Therapy Publications, 1971.

Bernal, M. E., Duryee, J. S., Pruett, H. L., & Burns, B. J. Behavior modification and the brat syndrome. Journal of Counseling and Clinical Psychology, 1968, 32, 447-455.

Cone, J. D., & Sloop, E. W. Parents as agents of change. In A. Jacobs & W. W. Spradlin (Eds.), The group as agent of change. New York: Behavioral Publications, 1974.

Doty, B. A. Teaching mothers to use behavior modification with their mentally retarded children. Paper presented at the annual meeting of the American Educational Research Association, Chicago, 1972.

Fredericks, H. D. G., Baldwin, V. L., McDonnell, J. J., Hofmann, R., & Harter, J. Parents educate their trainable children. Mental Retardation, 1971, 9(3), 24-26.

Gallon, S. L., & Jones, R. R. Systematic therapeutic intervention: An outline of a family treatment program. Oregon Research Institute Research Bulletin, 1972, 12, 2.

Galloway, C., & Galloway, K. C. Strategies for developing parent classes. Teaching Exceptional Children, 1971, 3, 120-128.

Gardner, J. E. Behavior therapy treatment approach to a psychogenic seizure case. Journal of Consulting Psychology, 1967, 31(2), 209-212.

Glogower, F., & Sloop, E. W. Two strategies of group training of parents as effective behavior modifiers. Behavior Therapy, 1976, 7, 177-184.

Hall, R. V., Axelrod, S., Tyler, L., Grief, E., Jones, F. C., & Robertson, R. Modification of behavior problems in the home with a parent as observer and experimenter. Journal of Applied Behavior Analysis, 1972, 5, 53-64.

Hall, R. V., Cristler, C., Cranston, S. S., & Tucker, B. Teachers and parents as researchers using multiple baseline designs. Journal of Applied Behavior Analysis, 1970, 3, 247-255.

Herbert, E. W., Pinkston, E. M., Hayden, M. L., Sagwai, T. E., Pinkston, S., Cordua, G., & Jackson, C. Adverse effects of differential parent attention. Journal of Applied Behavior Analysis, 1973, 6, 15-30.

Holland, C. J. Elimination by the parents of fire-setting behavior in a seven-year-old boy. Behavior Research and Therapy, 1969, 7, 135-137.

Holland, C. J. An interview guide for behavioral counseling with parents. Behavior Therapy, 1970, 1, 70-79.

Johnson, J. M. Using parents as contingency managers. Psychological Reports, 1971, 28, 703-710.

Johnson, S. M., & Brown, R. A. Producing behavior change in parents of disturbed children. Journal of Child Psychology and Psychiatry, 1969, 10, 107-121.

Kaswan, J. W., Love, L. W., & Rodnick, E. H. Information feedback as a method of clinical intervention and consultation. In C. D. Spielberger (Eds.), Current topics in clinical and community psychology, Vol. 3, New York: Academic Press, 1971.

Kroth, R. L., Whelan, R. J., & Stables, J. M. Teacher application of behavior principles in home and classroom environments. In E. L. Meyen, G. A. Vergason, and R. J. Whelan (Eds.), Strategies for teaching exceptional children. Denver: Love Publishing Company, 1972.

LeBow, M. D. The behavior modification process for parent-child therapy. Family Coordinator, 1973, 22, 313-319.

Mash, E. J., Terdal, L. Modification of mother-child interactions. Mental Retardation, 1973, 11(5), 44-49.

Matefy, R. E., Solanch, L., & Humphrey, E. Behavior modification in the home with students as co-therapists. American Journal of Psychotherapy, 1975, 29(2), 212-214.

Moore, B. L., & Bailey, J. S. Social punishment in the modification of a preschool child's "autistic-like" behavior with a mother as a therapist. Journal of Applied Behavior Analysis, 1973, 6, 497-507.

O'Dell, S. Training parents in behavior modification: a review. Psychological Bulletin, 1974, 81(7), 418-433.

O'Leary, K. D., O'Leary, S., & Becker, W. C. Modification of a deviant sibling interaction pattern in the home. Behavior Research and Therapy, 1967, 5, 113-120.

Patterson, G. R. Reprogramming the families of aggressive boys. In C. E. Thoreson (Ed.), Behavior modification in education, Part 1. Chicago: University of Chicago Press, 1973.

Patterson, G. R., Cobb, J. A., & Ray, R. S. A social engineering technology for retraining the families of aggressive boys. In H. E. Adams, and I. P. Unikel, Issues and trends in behavior therapy. Springfield: Charles C. Thomas Publishers, 1973.

Patterson, G. R., McNeal, S., Hawkins, N., & Phelps, R. Reprogramming the social environment. Journal of Child Psychology and Psychiatry, 1967, 8, 181-195.

Patterson, G. R., & Reid, J. B. Intervention for families of aggressive boys: A replication study. Behavior Research and Therapy, 1973, 11, 383-394.

Peine, H. A., & Munro, B. C. Behavioral management of parent training programs. Psychological Record, 1973, 23, 459-466.

Ray, J. S. The family training center: An experiment in normalization. Mental Retardation, 1974, 12(1), 12-13.

Salzinger, K., Feldman, R. S., & Portnoy, S. Training parents of brain-injured children in the use of operant conditioning procedures. Behavior Therapy, 1970, 1, 4-32.

Seitz, S., & Hoekenga, R. Modeling as a training tool for retarded children and their parents. Mental Retardation, 1974, 12(2), 28-30.

Stuart, R. B. Behavioral contracting within the families of delinquents. Journal of Behavior Therapy and Experimental Psychiatry, 1971, 2, 1-11.

Terdal, L., & Buell, J. Parent education in managing retarded children with behavior deficits and inappropriate behaviors. Mental Retardation, 1969, 7(3), 10-13.

Tharp, R. G., & Wetzel, R. J. Behavior modification in the natural environment. New York: Academic Press, 1969.

Tough, J. H., Hawksin, R. P., McArthur, M. M., & Van Ravenswaay, S. Modification of enuretic behavior by punishment: A new use for an old device. Behavior Therapy, 1971, 2, 567-574.

Ullman, L. P., & Kemp, C. H. Home intervention training programs. In D. Harshbarger, and R. F. Maley (Eds.), Behavior analysis and systems analysis. Kalamazoo, Michigan: Behaviordelia, 1974.

Wahler, R. G., Winkel, G. H., Peterson, R. F., & Morrison, D. C. Mothers as behavior therapists for their own children. Behavior Research and Therapy, 1965, 3, 113-124.

Walter, H. I., & Gilmore, S. K. Placebo versus social learning effect in parent training procedures designed to alter the behavior of aggressive boys. Behavior Therapy, 1973, 4, 361-377.

Watson, L. S., Jr., & Bassinger, J. F. Parent training technology: A potential service delivery program. Mental Retardation, 1974, 12(5), 3-10.

Wetzel, R. J., Baker, J., Roney, M., & Martin, M. Outpatient treatment of autistic behavior. Behavior Research and Therapy, 1966, 4, 169-177.

Wolf, M., Risley, T., & Mess, H. Application of operant conditioning procedures to the behavior problems of an autistic child. Behavior Research and Therapy, 1964, 1, 305-312.

Zeilberger, J., Sampen, S. E., & Sloane, H. N., Jr. Modification of a child's problem behaviors in the home with the mother as therapist. Journal of Applied Behavior Analysis, 1968, 1, 47-53.

Selected References - Paraprofessionals

Ayllon, T., & Azrin, N. The token economy. New York: Appleton-Century-Crofts, 1968.

Ayllon, T., & Michael, J. The psychiatric nurse as a behavioral engineer. Journal of the Experimental Analysis of Behavior, 1959, 2, 323-334.

Bensberg, G. J., Barnett, C. D., & Hurder, W. P. Training of the attendant personnel in residential facilities for the mentally retarded. Mental Retardation, 1964, 2, 144-151.

Bricker, W. A., Morgan, D. G., & Grabowski, J. G. Development and maintenance of a behavior modification repertoire of cottage attendants through television feedback. American Journal of Mental Deficiency, 1972, 77(2), 128-136.

Brierton, G., Garms, R., & Metzger, R. Practical problems encountered in an aide-administered token reward cottage program. Mental Retardation, 1969, 7(3), 40-43.

Christian, W. P., Hollomon, S. W., Lancer, C. L. An attendant operated feeding program for severely and profoundly retarded females. Mental Retardation, 1973, 11(5), 35-37.

Fielding, L. T., Errickson, E., & Bettin, G. Modification of staff behavior: A brief note. Behavior Therapy, 1961, 2, 550-553.

Frazier, T. W. Training institutional staff in behavior modification principles and techniques. In R. D. Rubin, H. Fensterheim, J. D. Henderson, and L. P. Ullman (Eds.), Advances in behavior therapy, Vol. 3. New York: Academic Press, 1972.

Gardner, J. M. Effects of reinforcement conditions on lateness and absence among institutional personnel. Ohio Research Quarterly, 1970, 3, 315-316.

Gardner, J. M. Innovation in the delivery of psychological services in an institution. American Psychologist, 1971, 26, 211-214.

Gardner, J. M. Selection of nonprofessionals for behavior modification programs. American Journal of Mental Deficiency, 1972, 76, 680-685.

Gardner, J. M. Teaching behavior modification to nonprofessionals. Journal of Applied Behavior Analysis, 1972, 5, 517-521.

Guess, D., Rutherford, G., Smith, J. O., & Ensminger, E. Utilization of subprofessional personnel in teaching language skills to mentally retarded children: An interim report. Mental Retardation, 1970, 8(2), 17-23.

Hollander, M., Plutchik, R., & Horner, V. Interaction of patient and attendant reinforcement programs: The "piggyback" effect. Journal of Consulting and Clinical Psychology, 1973, 41(1), 43-47.

Houts, P. S., & Scott, R. A. Associate instructors' manual for goal planning with developmentally disabled persons. Pennsylvania State University, Hershey, Pa., 1975.

Houts, P. S., & Scott, R. A. How to catch your staff doing something right, evaluating individualized goal plans. Pennsylvania State University, Hershey, Pa., 1976.

Houts, P. S., & Scott, R. A. New direction without insurrection: Implementing individualized goal planning in human service facilities. Pennsylvania State University, Hershey, Pa., 1976.

Loeber, R. Engineering the behavioral engineer. Journal of Applied Behavior Analysis, 1971, 4, 321-326.

McReynolds, W. T., & Coleman, J. Token economy: Patient and staff changes. Behavior Research and Therapy, 1972, 10, 29-34.

Panyan, M., Boozer, H., and Morris, N. Feedback to attendants as a reinforcer for applying operant techniques. Journal of Applied Behavior Analysis, 1970, 3, 1-4.

Panyan, M. C., & Patterson, E. T. Teaching attendants the applied aspects of behavior modification. Mental Retardation, 1974, 12(12), 30-32.

Parsonson, B. S., Baer, A. M., & Baer, D. M. The application of generalized correct social contingencies: An evaluation of a training program. Journal of Applied Behavior Analysis, 1974, 7, 427-437.

Patterson, R., Coolie, C., & Liberman, R. P. Reinforcing the reinforcers: A method of supplying feedback to nursing personnel. Behavior Therapy, 1972, 3, 444-446.

Paul, G. L., & McInnis, T. L. Attitudinal changes associated with two approaches to training mental health technicians in milieu and social-learning programs. Journal of Counseling and Clinical Psychology, 1974, 42, 21-33.

Paul, G. L., McInnis, T. L., & Mariotto, M. J. Objective performance outcomes associated with two approaches to training mental health technicians in milieu and social-learning programs. Journal of Abnormal Psychology, 1973, 82, 523-532.

Pazdun, H. Conflict: The nurse as therapist and researcher. Journal of Psychiatric Nursing and Mental Health Services, 1968, 6, 202-207.

Pomerleau, O. F., Bobrove, P. H. P. H., & Smith, R. H. Rewarding psychiatric aides for the behavioral improvement of assigned patients. Journal of Applied Behavior Analysis, 1973, 6, 383-390.

Pommer, D. A., & Streedbeck, D. Motivating staff performance in an operant learning program for children. Journal of Applied Behavior Analysis, 1974, 7, 217-221.

Poser, E. G. The teaching of behavior modification in an interdisciplinary setting. In R. D. Rubin and C. M. Franks, Advances in behavior therapy, 1968. New York: Academic Press, 1969.

Quilitch, H. R. A comparison of three staff-management procedures. Journal of Applied Behavior Analysis, 1975, 8, 59-66.

Quilitch, H. R., Miller, S. M., McConnell, M. A., & Bryant, S. Teaching personnel to implement behavioral programs. Educational Technolgoy, 1975, 15(1), 27-31.

Shane, H. Command performance: A behavior modification technique in a game format. Mental Retardation, 1974, 12(2), 18-20.

Sheehan, D., Panyan, M., Kemper, G., Horner, R. D., Hobson, S., Hodson, G., Farris, D., & Boozer, H. An institution-wide operant conditioning program to develop self-help skills. State Home and Training School Hospital Improvement Program Monograph No. 1, Wheatridge, Colorado, 1970.

Wallas, C. J., Davis, J. R., Liberman, R. P., & Baker, V. Modeling and staff behavior. Journal of Counseling and Clinical Psychology, 1973, 41, 422-425.

Watson, L. S., Jr. Behavior modification of residents and personnel in institutions for the mentally retarded. In A. A. Baumeister and E. Butterfield (Eds.), Residential facilities for the mentally retarded. Chicago: Aldine Publishing Company, 1970.

Watson, L. S., Jr., Gardner, J. M., & Sanders, C. Shaping and maintaining behavior modification skills in staff members in a mental retardation institution: Columbus State Institute behavior modification program. Mental Retardation, 1971, 9(3), 39-42.

Health Management

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Overview

In many instances, severely and profoundly handicapped students have extremely brittle medical existences (Sontag, Burke and York, 1973). Teachers may be faced with breathing problems (including choking), bleeding problems, dental problems, seizures and even administration of medication throughout the school day. These problems combined with the geographical location of many of Iowa's classrooms for the severely and profoundly handicapped make it necessary that teachers without ready access to a school nurse or other medical personnel know how to manage and refer health problems in their classrooms.

This module consists of four sections: health care needs, basic life support, dental care, and emergency care. The information to be presented in each section is very specialized and should be presented by the appropriate health care specialist designated.

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Objectives

General Objectives

Health Care Needs

1. Participants will learn about the health care needs of the severely and profoundly handicapped.
2. Participants will develop skills in assessing the health and safety needs of students.
3. Participants will have a general knowledge of the effects and side effects of drugs commonly used.
4. Participants will have specific knowledge of principles, procedures, and practices regarding the administration of commonly used drugs.
5. Participants will become familiar with common terms in anatomy and physiology.

Basic Life Support

6. Participants will learn the techniques of basic life support (CPR).
7. Participants will learn what actions to take during a health emergency.

Dental Care

8. Participants will understand the basic concepts of dental disease and preventive oral hygiene measures.
9. Participants will develop an awareness of the role plaque plays in dental disease.
10. Participants will be able to recognize periodontal disease problems common to the severely and profoundly handicapped.
11. Participants will know emergency procedures for accidental injuries to the mouth.

Specific Objectives

Health Care Needs

1. Participants will be able to list the nine body systems and describe what they do.
2. Participants will be able to define what a sign and a symptom are.
3. Participants will list and describe the four types of epileptic seizures.
4. Participants will list six major factors concerning seizure activity occurring during school hours to communicate to parents and appropriate personnel (nurse).
5. Participants will list side effects of four common medications used for seizure control.
6. Participants will list the five purposes for which medications are given.

Basic Life Support

These objectives are listed when the instructor presents the training, i.e., this is a hand-out distributed by the representative of the Heart Association.

Dental Care

1. Participants will write the definition for "plaque" and describe its role in dental disease.
2. Participants will demonstrate the proper oral hygiene methods for plaque removal.
3. Participants will list in writing appropriate measures to care for dental injury.

Emergency Care

1. Participants will explain the responsibility of the teacher to treat or seek treatment for a student.
2. Participants will list materials for an aid kit which the school should have available.
3. Participants will become aware of preventive measures which can be taken in school.
4. Participants will explain how to access the emergency medical services system.
5. Participants will become aware of basic knowledge and understanding of the following:
   a. shock
   b. bleeding
   c. epilepsy
   d. fractures and dislocations
   e. patient examination
6. Participants will practice bandaging and splinting.

Materials

Instructor Materials

Participant Materials

Health Care Needs

-anatomic chart transparencies (or charts, slides, drawings)
-overhead projector
-transparency pens
-screen
-blank transparencies

-2 pre/post tests per participant
-1 copy per participant of medication handout from Iowa Rules of Special Education
-1 copy per participant of Iowa's Child Abuse law
-1 copy per participant of "appropriate responses to seizures"

Basic Life Support

The instructor should contact either the American Red Cross or the Iowa Heart Association for further information and materials required.

Dental Care

- dental transparencies
- large tooth model and toothbrush
-slides
-slide projector
-screen
-typodont toothbrush
-video-tape "Home Dental Care for the Handicapped Child"
-video monitor
-video-tape deck
-adaptive equipment

-2 copies per participant of pre and post test
-1 copy per participant of "Dental Vocabulary List"
-toothbrush, floss, disclosing tablets, mirror, dixie cups, kleenex for each participant
-1 copy per participant of "Home Dental Care for Handicapped"

Emergency Care

The instructor should contact the Emergency Medical Services in order to obtain further information regarding materials needed for this section. The instructor should duplicate 2 copies per participant of the pre/post test.

Methodology

Health Care Needs

20 min. Pretest

1 hr. The instructor for this section should be a doctor or nurse. Upon collection of the pretests, the instructor will introduce the Health Care Needs Section of the Health Management Module by giving an overview of the human body. The instructor should refer to the lecture notes. The instructor should use anatomic chart transparencies for each system of the body and for overall body structure. If transparencies are not available, illustrations such as charts, slides or drawings may be used. These illustrations will help participants to visualize the systems of the body. The main parts of each body system should be pointed out and discussed. At the conclusion of the presentation, the instructor should summarize the nine body systems and answer any questions the participants may have.

1 hr. The instructor will follow the outline and present material found in the lecture notes entitled "Health Care Needs." Further instructions will be found in the lecture notes. In discussing the Child Abuse Laws, the instructor may wish to contact the Department of Social Services and have a case manager participate in a panel discussion.

30 min. The instructor will discuss epilepsy, following instructions found in the lecture notes.

1 hr. The instructor will discuss seizures and medications, following instructions found in the lecture notes.

20 min. Post-test

Basic Life Support

8 hours Basic life support is an emergency first aid procedure that consists of recognizing respiratory and cardiac arrest and starting the proper application of cardiopulmonary resuscitation (CPR) to maintain life until a victim recovers sufficiently to be transported or until advanced life support is available.

CPR is an emergency procedure that requires special training both to recognize cardiopulmonary arrest and to perform artificial ventilation and artificial circulation. In order to further safeguard the severely and profoundly handicapped pupils in the state of Iowa, certification in basic life support techniques should be obtained by each participant as a requirement for successfully completing this inservice training package.

The purpose of certification is, as far as possible, to maintain adherence to uniform national standards established or recognized by the American Heart Association and American Red Cross. Certification will be accomplished through the use of national cognitive (written or

oral) and performance examinations. Receipt of certification will be contingent on satisfactory completion of such examinations and will indicate that the person certified was found to be qualified at the time of examination to perform those emergency techniques indicated by the certifying individual or agency.

An initial course leading to certification in CPR should be for small groups and should include didactic presentations and sufficient supervised, intensive manikin practice detecting breathlessness and pulselessness and in performing the sequential steps of rescue breathing and external cardiac compression. Both one-rescuer and two-rescuer CPR should be practiced.

Manikins used in CPR training programs must provide (a) airway obstruction when the neck is flexed, (b) effective chest movement as a result of proper lung ventilation via mouth or nose, and (c) adequate movement of the sternum as a result of properly applied external cardiac compression against resistance.

In order to be appropriately certified, instruction must be provided by a certified basic life support instructor. To obtain information about qualified and authorized instructors, manikins, and print materials needed, please contact the agencies listed in the bibliography. *Supplement to JAMA (The Journal of the American Medical Association) February 18, 1974, Volume 227, No. 7, pp. 841, 850-851.*

Dental Care

This section must be taught by a dentist or dental hygenist with experience in working with handicapped children. Please refer to Transparency No. 4 for information regarding availability of qualified individuals.

20 min. Pretest

5 min. The instructor will distribute the dental vocabulary list. Refer to participant materials section.

1 hr. Referring to the lecture notes, the instructor will discuss "Basic Facts About Teeth". The instructor should utilize Transparencies No. 1 and 2, or his/her own illustrations of a large tooth model.

3 hrs.

1. The instructor will lecture, referring to the article "Caring for Handicapped Children's Dental Health Needs" in the lecture notes. The instructor will want to utilize slides which show specific dental problems described in the lecture notes. He/she may refer to the instructor's materials section for a list of slides. The instructor should use his/her own slides.

2. The instructor will use typodont and a brush to demonstrate correct brushing procedures. A toothbrush, floss, disclosing tablets, a mirror, a dixie cup and kleenex should be distributed to each participant. The participants will stain plaque using the disclosing tablets and then attempt to

remove all plaque by brushing, working in a regular pattern around the mouth. The participants will use the mirrors to determine their progress. Floss will be needed to remove plaque from the side the brush cannot reach.

To make learning less confusing and to help establish a habit, a routine for brushing should be developed. This is also helpful in the classroom. The instructor will demonstrate:

a) start brushing on the cheek side of the back, right, top, and proceed all the way around;
b) move to the inside, back, left, upper teeth;
c) start again, with the outside of the right, lower teeth;
d) the inside of the lowers, beginning on the left side (be sure the last molar is included).

3. The instructor will use typodont to demonstrate correct flossing procedures. He/she will distribute the flossing material and have each participant practice flossing.

4. The instructor should bring examples of adaptive equipment to show participants.

5. To practice holding the child, the participants should pair off to act out brushing, flossing and positioning techniques. One person should take the role of the teacher and one the role of the child. They should then reverse roles.

6. At this time, the instructor should present the lecture notes on First Aid for Dental Emergencies.

30 min. Summary: The manual "Home Dental Care for the Handicapped Child" will be distributed to the participants. The instructor will show the video tape which corresponds to the manual: "Home Dental Care for the Handicapped Child" (purchase/rental information can be found in the bibliography section).

30 min. The instructor will lead a discussion on the subject of home dental care for the handicapped child.

20 min. Post-test

Emergency Care

In the instructional activities section you will find an emergency care outline. We feel the topics outlined include critical knowledge and skills which a teacher of the severely and profoundly handicapped should be aware of. If you feel further topics should be covered, please expand and modify this section.

This section does require instruction from a certified Emergency Medical Technician (EMT). Contact your local ambulance service or the agency listed in the bibliography.

In conjunction with this section we would encourage all participants to secure or renew Red Cross certification in First Aid. For information regarding first aid training programs, contact your local Red Cross chapter or your local hospital or area community college.

Suggested time for completion of module: 21 hours.

Instructor Materials: Lecture Notes

HEALTH CARE NEEDS

The human body is composed of nine systems. Each system of the body has a specific function, and none can function independently. For example, if the heart were to stop functioning, there would be no oxygen circulated to the rest of the body because the blood cells would not be moving. When all systems are in good working condition the person is in "good health." A minor malfunction of any system can have very drastic effects on the "good health" of the person.

A. Body Systems

1. *Skeletal system and body cavities.* The skeletal system consists of the bones that form the supporting framework of the body; it also protects body organs. (Display anatomic chart and identify major system elements and body cavities:)

   a. *Skull.* The skull consists of the cranium (which contains the brain) and the face.

   b. *Spinal column*

      1) The spinal column encloses the spinal cord.

      2) The brain connects with the spinal cord through a large opening at the base of the skull in the center of the upper neck.

      3) The spinal cord is the central supportive bony structure of the body and consists of 33 bones known as vertebrae.

      4) The spine is divided into five sections:

         a) Cervical spine——neck
         b) Thoracic spine——upper back
         c) Lumbar spine——lower back
         d) Sacrum
         e) Coccyx or tail bone

   c. *Upper Extremities*

      1) The upper extremities extend from the shoulder to the fingertips.

      2) The bone in the upper arm is known as the humerus.

      3) The bones in the lower arm are known as the radius and ulna.

   d. *Thoracic (rib) cage*

      1) The chest is enclosed by 12 ribs which are attached to the thoracic vertebrae in back; the top 10 ribs are attached to the sternum (breastbone) in front.

      2) The clavicle (collarbone) connects with the sternum (breastbone).

      3) The rib cage encloses the heart and lungs——the vital organs of the body.

      4) The diaphragm is a muscle which moves up and down while breathing; it separates the chest cavity from the abdominal cavity.

e. *Abdominal cavity*

1) The back boundary of the abdominal cavity consists of:

a. The lumbar spine
b. The sacrum
c. The coccyx (tail bone)

2) The abdomen contains organs of digestion and excretion including the liver, gall bladder, spleen, pancreas, kidneys, stomach, intestines, bladder, and rectum.

3) The abdomen also contains female reproductive organs.

4) The lower part of the abdomen is more properly called the pelvic cavity.

f. *Pelvic cavity*

1) The pelvic cavity is bounded by the sacrum, hip bones and the pubis; it is continuous with the abdominal cavity.

2) The pelvic cavity protects the lower abdomen: the bladder, the rectum and the internal female sexual organs.

g. *Lower extremities*

1) The lower extremities extend from the hips to the toes.

2) The bone in the upper leg (thigh) is known as the femur.

3) The bones in the lower leg are known as the tibia and fibula.

2. *Muscular system.* The muscular system consists of the tissue that contracts and relaxes to permit body movement or function.

a. *Voluntary muscles*--those which we control at will, for example, the skeletal muscles that permit us to move.

b. *Involuntary muscles*——those which work automatically, for example, the diaphragm which permits us to breathe.

c. *Cardiac muscle*——the walls of the heart are a special type of involuntary muscle that keep the heart functioning automatically.

3. *Nervous system.* The nervous system consists of the brain, spinal cord and nerves that control and permit all body activities and sensations. A muscle will not move if the nerves that serve it are cut.

4. *Respiratory system.* The respiratory system consists of the organs of the body which permit us to breathe. It provides for the intake of oxygen needed by the body to survive and the release of carbon dioxide and other substances. Main elements are:

a. Nose and Mouth
b. Pharynx
c. Larynx
d. Trachea

e. Bronchi
f. Lungs

5. *Circulatory system.* The circulatory system consists of the heart (a pump) and a system of arteries which transport blood containing oxygen to all body systems, capillaries through whose thin walls oxygen and other products are exchanged with body cells, and veins which transport blood containing waste products from the body cells to be eliminated.

6. *Digestive system.* The digestive system consists of the organs which permit us to eat, digest, and eliminate foods, including:

   a. Mouth and Throat
   b. Esophagus
   c. Stomach
   d. Liver
   e. Gall bladder
   f. Pancreas
   g. Intestines
   h. Rectum

7. *Genitourinary system.* The genitourinary system consists of the organs which permit us to eliminate certain waste materials filtered from the blood and to reproduce, including:

   a. Kidneys
   b. Ureter
   c. Urethra
   d. Bladder
   e. Male and Female Reproductive Organs

8. *Endocrine system.* The endocrine system secretes chemicals, called hormones, which regulate body processes. The endocrine system consists of the thyroid, ovaries, pancreas, testes, and adrenal glands.

9. *Integumentary system (skin).* The integumentary system protects the body from harmful germs, helps regulate temperature, serves an excretory function, manufactures vitamin D, and makes you more presentable to others.

B. Health Care Needs

1. *Definition of health*
   a. Optimal physical and psychosocial functioning (health is not just the absence of disease)
   b. Optimal interaction between the individual and his/her environment

2. *The teacher's role in health care is essentially as an observer*

3. *Diagnostic signs*

   a. *Signs vs. Symptoms*- Throughout the module, reference will be made to signs and symptoms; therefore, an initial definition of their meaning is in order:

      1) A *sign* is something a person sees, hears, or feels; for example, a pale face, no respiration, cold skin.

      2) A *symptom* is something a person tells about him/herself, that is s/he feels nauseous, his/her back hurts, s/he has no sensations in the extremities.

b. *Overview of signs.* A brief overview of the important diagnostic signs is given below.

1) *Pulse*

a) The normal pulse rate for adults is 60 to 80 beats per minute; a normal rate for children is 80 to 100 beats per minute.

b) The pulse is normally taken at the carotid artery in emergency care work——have each student find his/her own carotid pulse.

c) The pulse can be:

i) Absent
ii) Slow or fast
iii) Weak or pounding
iv) Irregular

2) *Respirations*

a) The normal respiratory rate for adults is about 17 breaths per minute; for children, it is 20 to 25 breaths per minute, for infants the rate is 25 to 35 breaths per minute.

b) Respirations may be heard or felt at the nose and mouth, and the chest can be seen rising and falling.

c) Respirations can be:

i) Absent
ii) Slow or fast
iii) Shallow or deep
iv) Gasping, labored, or choking

3) *Temperature*

a) Normal body temperature is 98.6 degrees.

b) In emergency care, temperature is estimated by feel using the back of the hand on the patient's skin.

c) The skin is largely responsible for temperature regulation by radiation of heat and evaporation of water.

d) The skin can be:

i) Cold or hot
ii) Wet, clammy or dry

4) *Skin color*

a) Skin color is a useful sign for lightly pigmented people.

b) Skin color can be:

i) White, pale or ashen
ii) Red or flushed

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iii) Blue (for people with dark pigmentation, blue may be noted around the fingernails.)

5) *Pupils of the eye*

a) The pupils of the eyes are normally equal in size and constrict (get small) when exposed to light.

b) Pupils can be:

i) Dilated (enlarged)
ii) Constricted
iii) Unequal
iv) Fixed

6) *State of consciousness*

a) The normal person is alert, oriented and responds to vocal or physical stimuli.

b) A person's state of consciousness may range from normal to mildly confused, disoriented, or unconscious.

7) *Inability to move on command*——an indicator of paralysis.

a) The normal conscious person can move his/her body when requested to do so.

b) A person may not be able to move his/her legs, both arms and legs, or one side of the body.

8) *Reaction to physical stimulation*——an indicator of paralysis.

a) The normal person can feel someone touch his/her body.

b) A person may have no sensation or a numb feeling in the arms and/or legs or certain parts of the body.

c. As the observer the teacher needs to apply these diagnostic signs to each student in the class.

1) Assess specific needs: a visually impaired child needs additional clues and stimulation to develop head control——"Turn toward sound" is unrealistic

2) Assess the developmental stage in order to set individual goals

3) Assess the behavior in terms of the student's health status

4) Develop a data base for each child——be aware of:
a) What does breathing sound like on "good" days?
b) What are this child's seizures like?
c) How does this child usually react to class procedures?
d) Are there cyclic changes before periods, etc.?
e) How does this child respond to class visitors?

d. It is important to work on and sharpen observation skills.

1) Become alert to changes——even slight deviations from the usual may be significant.

2) Take responsibility for reporting these changes to:
   a) nurse
   b) parent
   c) administration

4. Individual care involves many different areas for S/PH

a. Monitoring the diet and actual food intake becomes important when the child has problems with chewing skills or increased gag reflex.

1) The teacher needs knowledge of different feeding techniques.

2) The teacher needs knowledge of interfering reflexes and management adaptations.

b. Monitoring fluid intake is sometimes neglected.

1) Water intake cannot be emphasized enough.
   a) Kool-aid, juices and milk are used too much
   b) These all have negative implications for some children
      ——Milk aggravates child with congestion
      ——Kool-aid adds sugar not needed by over-weight child with dental problems or poor appetite

c. Ostomy care or pumping shunts may be part of daily routine

1) Use the parent as a resource person
   a) Parents need to be involved and needed
   b) Parents probably have some good tricks to make care easier

d. Skin care and monitoring becomes increasingly important as a student is less mobile

1) A student in a wheelchair has vulnerable pressure points——build the schedule to alternate wheelchair time and mat time

2) A child wearing braces has problems with pressure areas and needs time out of braces for stimulation/therapy and inspection

3) It is important to remember that transit time may be long and must be accounted for

e. Hygiene becomes a school problem with S/PH

1) Oral care involves meticulous care of teeth and gums
   a) The problem of gingival hyperplasia can be greatly diminished
   b) Techniques can be learned/developed even for a child with spastic bite reflex

2) Menstrual hygiene must be monitored for most girls
   a) Diapered teen-ager needs special care
   b) Vaginal infections need prompt treatment

c) Nurse needs to approach parents about hysterectomy

3) Genitals of both sexes need care
   a) Girls not responsible enough for adequate cleaning during toileting or bathing
   b) Many times boys are uncircumcised because of unstable condition at birth and foreskin must be pulled back and cleaned daily
   c) Make sure that masturbation is not aggravated by infection

4) Routines such as shampoos, cutting nails, control of acne, etc. may need to be part of program

5. Record keeping may be done in many ways but *must* be done

   a. Elimination should be recorded whether or not student is on bowel training program or toilet training or toilet conditioning program---and these *are* different

      1) Parents need information about BM's or diarrhea and times/day

      2) Two areas where teachers learn quickly by their mistakes:
         a) The first time they get "squirted" by a little boy because they left him uncovered too long
         b) The first time a mother gives a laxative which works tomorrow because the teacher forgot to report a BM.

   b. It may be necessary to record wheelchair time for some or time in braces, especially when a student is newly positioned or has new braces and is working up tolerance to new pressures.

   c. It may be necessary to record weights on a weekly basis for Down's students or others with a weight problem.

   d. Recording of seizures in specific terms is important to generate information to determine a pattern.

      1) Including time of day, duration, progression, body parts involved, skin color, pupils, respirations, saliva.

      2) Typical for that child or unusual aspects.

      3) Parents should be informed of seizures and encouraged to give seizure information to the school.

   e. Record of medications given becomes a personal responsibility

      1) Hand out and review rule from the Iowa Department of Public Instruction's "Rules for Special Education" (refer to participant materials section)

      2) Teacher responsibility includes:
         a) Make sure parent release form is on file.
         b) Know about the medication begin given.
            i) Review implications, expected reactions, side effects, etc. with school nurse or doctor.
         c) Understand implications of giving medication if the rules are not followed.
            i) Use your own judgement (knowledge of parent) when you get the

hastily written pencilled note with antibiotics, antihistamines, decongestants, aspirins, tylenol, etc.

ii) Know your liability.

3) Remember that the medication record is a legal document.
   a) Use pen, not pencil.
   b) Use initials, not just check marks.
   c) Have an accurate description of the medicine, not just "small yellow pill'

4) Have a procedure written out for a substitute which is clear and fool-proof.
   a) Make sure identification of students/medication is clear.

5) Teachers must be familiar with any medications the child is receiving and their effect on behavior. The child's activity level and ability to carry out a particular task sequence may be affected by the administration of certain drugs.

6. Communication is the key to making other people aware of the kind of a job you are doing

a. Parents need information to be a part of the success of any program

1) The importance of giving parents information about seizures, BM's, food, etc. must be reiterated.

2) It is also important to involve parents in goal setting because the goals of home and school must be mutual
   a) Sometimes we find that we are working for some independence and parents are not really ready to relinquish this, i.e., feeding and toileting

b. Parents need some guidance and information about areas of development

1) Talk to them about the sexuality of these students
   a) Help them see that they grow into adolescent and adult emotions
   b) Show them you can accept the student as a sexual being and it will help parents come to acceptance

2) Talk about development in terms of optimal achievement and yet be realistic
   a) Help parents understand task analysis and achieving tiny steps toward goals

c. Communication with other support personnel produces results in algebraic progression

1) No one discipline has all the expertise needed to develop programs for these students

2) Efficient and effective communication with other disciplines is what makes the team approach produce success

7. Special problems of the S/PH in the school setting

a. Transportation presents some unique problem areas to be aware of

1) The actual time on the bus needs to be noted for students in wheelchairs or braces and made a part of the schedule

2) Bus personnel need some in-service about seizures and specific instructions (maybe even equipment such as pillow, blanket, etc.) about each child with a convulsive disorder

3) Students with lack of head and trunk control will need special adaptive equipment
   a) A wheelchair if lift buses are available
   b) An adaptive carrier which can be strapped into the bus seat can be made

4) Bus personnel need some training in managing specific behaviors

8. Teachers need to be aware of legal aspects of health care for students

a. Liability for medication errors would involve not only the teacher but school administrator, nurse and probably the school system

1) Teachers need to have input in developing forms used for parent release, recording administration of medications, and they must know if proper releases are on file

2) Teachers need to have input in developing a system for keeping medications in the classroom or the building
   a) If medications are kept in a central area the tendency is to take a pill to the student
   b) Medications kept in the room are more easily administered to nonambulatory students and possibility of error is reduced

3) Teachers must be aware of high risk situations for medication errors
   a) Factors contributing to increased risk of errors are:
      i) Lack of training and knowledge on part of staff person administering medication
      ii) Use of increasing variety of drugs with multiple effects and interactions
      iii) Low level of awareness and lack of communication skills of students

b. Teachers have a responsibility to know child abuse laws for their own state

1) Statistics show that there is a high incidence of child abuse in the handicapped population

2) Hand out and discuss Iowa's child abuse law

C. Epilepsy

1. What is epilepsy?

a. The word "epilepsy" is Greek for seizure. It is hard to define a seizure simply and exactly. Perhaps the best way is this: a seizure is a temporary loss or impairment of consciousness; it usually occurs without apparent cause; usually is accompanied by muscular movements which may range anywhere from a light twitching of the eyelids to a violent shaking of the entire body.

b. Epilepsy is a fairly common disease. It affects people in all walks of life, from all ethnic backgrounds.

c. Many suffer--about one in two hundred in the United States or approximately one million in the U.S. The cost is tremendous in both money and manpower. It amounts to at least $60,000,000 per year. Measured in heartaches and wrecked lives, the toll is sorrowfully high.

2. Some conditions that may lead to seizures are:

a. An injury to the brain. This may occur before a person is born or during birth. It may be the result of an infection that has settled in the brain after a disease like sleeping sickness, measles, meningitis or whooping cough. It may come from a severe head injury or from a tumor in the brain.

b. Bodily disorders. These disorders, reacting unfavorably on the brain, may lead to seizures, i.e., kidney diseases or gland disturbances.

c. Emotional upsets. These cannot cause seizures, but may precipitate them by acting upon already disordered parts of the brain. Emotional disturbances are common in adolescence and occasionally seizures are attributed to them. They also are often thought to be a factor in cases that develop in later life.

3. Types of seizures:
Seizures are infinitely varied in form, but doctors recognize these four main types:

a. Grand Mal (more common than other types): About 50% experience an aura prior to having a grand mal seizure.

1) Loss of consciousness (loss of speech)

2) Muscles tighten

3) Fall to floor or ground

4) May cry out or groan although s/he is not in pain

5) Excess saliva——no swallowing

6) Labored breathing, blowing, or snorting

7) Face may be first dusky, then pale

8) Rolling of eyes

9) Violent twitching for 45-60 seconds (seems much longer to worried bystander)

10) Oxygen deficiency——blue lips

11) May be incontinent

12) May sleep heavily for hours or may get up but feel dull for short period, have headache, or s/he may immediately return to normal self

b. Petit Mal (pronounced "petty- mahl"): These occur much more frequently and are often overlooked because they last only a few seconds. Petit mal seizures may consist of:

1) Brief or blank stare——may be accompanied by:

2) Rhythmic twitching of eyelids or eyebrows

3) May stop in middle of sentence (or at work) stare vacantly, blink, then go on seemingly not at all confused. (Parents often disregard petit mal attacks in childhood, supposing they will eventually disappear and usually do. However, out of a large group studied, one out of three with petit mal later develop grand mal

4) May fall, but generally not

5) Most common in childhood or adolescence

6) They are not unconscious; rather have impairment of the conscious state.

c. Psychomotor. This is most difficult to diagnose because the attacks vary greatly from one person to another, and because the mild form may look like petit mal and the severe form resembles grand mal. This type of seizure occurs in approximately one third of adult epileptics.

1) Unaware of what is going on (not always unconscious)

2) May appear to be conscious, but does not later remember anything that happened.

3) May appear to be a temper tantrum; wandering about room, pulling down pictures, throwing books, knocking over furniture.

4) Chewing, smacking lips

5) Raging; may attack

6) Searching movements

7) Opening and shutting or slamming doors

8) Confused and very worried
(May show one or more of these, but not likely all in one person or at the same time. Men are more prone to this type than women.)

d. Jacksonian. Named after the neurologist who first described it. Modified grand mal. In first part:

1) Person remains conscious

2) Twitching or numbness of one leg or arm or side of face or trunk; gradually spreads to include greater portion of body.

3) Often becomes unconscious late in attack. Indicates that attack arises in certain part of brain's surface, opposite to side of body in which attack begins. Means that something——tumor or scar——is irritating brain at this point. In some cases surgical removal may be recommended.

4. Warnings
A good many persons, about 50%, have some kind of warning doctors call "aura". This is a Latin word for wind, like a gust before a storm, and is really a part of the seizure. It can consist of:

a. "Queer feeling" in stomach or nausea

b. Giddiness or of "things going black"

c. Unusual irritability or pallor

d. Enlarged pupils

5. Daily needs of the epileptic:

   a. Balanced diet, exercise and rest are all important to the epileptic.

   b. What to do for a person in a seizure:
   Generally once the attack has started, nothing can stop it. Petit mal usually requires little or no special attention, other than observation. If a person associates, recognizes warning signals, she/he can be taken to a spot of safety and seclusion. In grand mal, an enlightened bystander can do much, such as:

      1) If seen at start of attack, lower to floor or ground, away from furniture or other hard objects.

      2) Break fall, if close enough.

      3) Get person in comfortable position; on his/her side, to allow the saliva to flow from the mouth.

      4) Place blanket or foot under head, to protect the head from being bruised.

      5) Loosen any tight clothing around neck or waist, remove beads and any ornaments from hair.

      6) Turn head to one side to allow saliva to flow out.

      7) Use of tongue depressor is discouraged.

      8) Allow freedom of movement. Do not restrain or hold down.

      9) Allow the person to come out of it gradually.

      10) When convulsions cease, move the person to a quiet place. Allow him/her to regain consciousness naturally. Do not converse or question him/her but allay fears. She/he may or may not wish to lie down. She/he may be drowsy or have a headache. Observe.

      11) Above all, remain calm.

6. Goals
   The goal is to render the person free of attacks. This cannot be done in a short time. The chief means of increasing resistance is medication. The right medication under expert guidance will, in most cases, greatly lessen the number and severity of seizures and in many cases, stop them entirely.
   Following is a list of medications most commonly used for seizures:
   a. Dilantin
   b. Mysoline
   c. Celontin
   d. Mesantoin
   e. Milontin
   f. Tridione
   g. Mebaral
   h. Librium——muscle relaxant used with other medication
   i. Phenobarbital——used with other medication
   j. Valium

D. Seizures and Medications

1. General-hand out and discuss "Appropriate Response to Seizures"; refer to participant materials section

   a. What to notice and communicate to the parent when observing a seizure:

      1) The time of day it occurs

      2) The number of seconds during the unconscious state

      3) What activity the child was doing just prior to the onset of the seizure

      4) Characteristics noted during the seizure—
         a) Muscle movement of body parts
         b) Cyanosis
         c) Rolling of the eyes
         d) Little or no breathing
         e) Did the muscle contractions start on one side of the body and move to the other side?

      5) What activity followed the seizure?

      6) Were there any complaints of pain? If so, where?

   b. Side effects of medication can occur when a child begins taking medication or when dosage is increased. It is suggested that teachers know the common drugs the children are receiving and the side effects. A child's response and awareness level may be affected by the drugs.

   c. It is the teacher's responsibility to be knowledgeable about the medication given

      1) Need to know what it looks like or smells like

      2) Need to know dosage and times of administration and how it is to be given

      3) Need to be aware of both desirable, expected reactions and possible undesirable side effects

      4) Need to know that release is on file

      5) Need to know rules of DPI are followed such as proper information on bottle etc.

      6) Need to establish complete and accurate recording system

      7) Need to remember you *can* refuse to give medication if you have unanswered questions about it or if rules are not followed

2. Common drugs - drugs are substances used to maintain health, prevent disease, relieve symptoms, supply a body need or cure disease. The amount of a drug or dosage influences the drug's effect on the body. Different persons can react to the same drug in different ways because people are different. Side effects of drugs used to treat disease and illness can be more serious than the original condition.

   a. Dilantin
      Use: Grand mal seizures
           Psychomotor seizures

Adverse Reactions:
- Hyperplasia of gums
- Drowsiness
- Nervousness
- Dizziness
- Loss of muscle coordination and blurred vision

Nursing Implications:
- Number of seizures will increase with physical exercise and emotional stress.
- Hypertrophy of gums will occur if good oral hygiene is not met.

b. Mysoline

Use:
- Used alone or in combination with other drugs for grand mal and psychomotor seizures.

Adverse Reactions:
- Sedation
- Fatigue
- Hyperirritability

Nursing Implications:
- Sedation and drowsiness may be severe at the start of the drug therapy.

c. Phenobarbital

Use:
- Depress hyperexcitability of cerebral cortex

Adverse Reactions:
- Drowsiness
- Lethargy
- Skin hypersensitivity
- Fatigue
- Ataxia
- Constipation
- Depression
- Nausea
- Blurred vision
- Insomnia
- Tremor

Nursing Implications:
- Long-acting barbituate which may have accumulative effect; therefore, be alert for adverse reactions in patients who tolerate the drug well.

d. Mebaral

Use:
- Control grand mal and petit mal epilepsy

Adverse Reactions:
- Drowsiness
- Lethargy

Nursing Implications:
- None

e. Celontin

Use:
- Petit mal seizures; may be in combination with other anticonvulsants

Adverse Reactions:
- Drowsiness
- Ataxia

Dizziness
Irritability

Nursing Implications:
Gastrointestinal symptoms occur frequently and have included nausea or vomiting.

f. Mesantoin

Use:
Grand Mal, focal, Jacksonian, psychomotor

Adverse Reactions:
Drowsiness
Ataxia
Diplopia
Fatigue
Irritability
Depression

Nursing Implications:
Patient must be kept under close medical supervision at all times.

g. Milontin

Use:
Petit mal

Adverse Reactions:
Drowsiness
Dizziness
Ataxia
Lethargy

Nursing Implications:
Gastrointestinal symptoms such as nausea, vomiting and anorexia occur frequently, but may be the result of overdosage.

h. Tridione

Use:
Petit mal

Adverse Reactions:
Drowsiness
Irritability
Fatigue
Skin rashes
Bleeding gums

Nursing Implicatons:
Gastrointestinal effects include nausea, vomiting, abdominal pain.

DENTAL CARE

Basic Facts About Teeth - General

Hand out "Dental Vocabulary List" to each participant (refer to participant materials section)

The teeth serve two functions in overall health. The major function, chewing (mastication) is the first step in digestion. The second function of teeth is the role they play in speech. Teeth in poor condition cannot chew food properly and can affect pronunciation. Whatever the condition of the teeth, they play an important part in personal appearance and self-image.

There are four types of teeth: *(refer to transparency 1)*

1. *Incisors* are located at the center and front of the mouth. Their purpose is to cut food. (analogy - scissors)
2. *Canines* (cuspids) are located at the corners of the mouth, and they break and tear food. (analogy - pliers)
3. *Premolars* (bicuspids) are in front of the six molars, and tear and grind food. (analogy - nutcracker) These teeth are not found in children who still have their primary (baby) deciduous teeth. They appear when the permanent teeth erupt.
4. *Molars* are the back teeth. They grind food like a mixer.

The major parts *(refer to transparency 2)* of the tooth are the *root,* which anchors the tooth to the jaw, and the *crown,* which is the visible part of the tooth. Each tooth is supported by three structures: gingiva (gum), periodontal ligament, alveolar bone.

The gingiva covers the bone and surrounds the tooth. The peridontal ligament is a fibrous tissue that anchors the root to the bone. It also holds the tooth in place and serves as a shock absorber. The alveolar bone surrounds and supports the roots of the tooth.

Each individual tooth is composed of four layers. The first layer is the *enamel.* It is the layer that we see; it is the hardest substance in the body; it glistens and covers the crown.

The next layer is called *dentin.* It forms the largest part of the tooth and is not as hard as enamel. The next layer is the *pulp.* This "nerve" of the tooth is located at the center, and contains the blood vessels and nerves that nourish the tooth. The pulp is protected by a mineralized layer called *cementum.*

Each individual has two natural sets of teeth during his/her lifetime——the primary (decidous) teeth and the permanent teeth.

The primary teeth begin forming before birth and usually begin to erupt between four and eight months of age. By the time a child is two and a half years old, all 20 primary teeth have erupted. Included in these primary teeth are four central incisors (two center teeth on top and bottom), four lateral incisors (one on either side of central incisors, on top and bottom), four cuspids, and eight primary molars.

These decidous teeth serve as guides for the permanent teeth and aid in proper development of the jaw and facial structures. These teeth also serve a major role in mastication, speech and personal appearance. They should be cared for just as permanent teeth to prevent premature loss and decay. If these primary teeth are allowed to decay and go untreated, they can damage the permanent teeth underneath.

Permanent teeth usually begin forming at about six months of age. As they erupt the roots of the primary teeth are resorbed. The permanent first molars (six-year molars) are the most important to erupt. They help stabilize the position of the upper and lower jaws and serve as guides for alignment for the rest of the teeth. Unfortunately, because they are the first to erupt, they are frequent casualties of dental disease.

Malocclusion

Malocclusion is irregularity in tooth or jaw position which prevents upper and lower teeth from

coming together in proper alignment (occlusion). Malocclusion can be caused by environmental factors or heredity. Periodontal (gum) disease, later in life can be caused by malocclusion. An incorrect bite can interfere with chewing, making it necessary for an individual to avoid some foods necessary for adequate nutrition. Malocclusion can also affect an individual's speech and personal appearance. Early dental health care can prevent malocclusion and, if needed, special treatment by an orthodontist can correct an existing problem.

Basic Facts About Dental Disease

Dental caries, or tooth decay, is the most widespread dental disease — affecting at least 95% of all Americans at some time in their lives. The crevices, fissures, gumline areas, and surfaces in contact with other teeth are most vulnerable parts. Other areas of the teeth are protected by the normal, self-cleaning actions of the tongue, cheeks, saliva, and food.

One of the major causes of tooth decay and peridontal (gum) disease is *plaque.* Plaque is an almost invisible film of decomposed food particles and millions of living bacteria.

The bacteria use the refined sugar from food to produce acid. This acid dissolves the tooth enamel to which it is exposed. A simple formula to remember is:

Sugar + Saliva + Bacteria = Plaque

Plaque + Sugar = Acid

Acid + Tooth = Decay

Calculus (tartar) is a hard, crust-like material which forms along the gumline on the teeth. It is composed of minerals from saliva, bacteria from plaque, and other substances normally found in the mouth. Once calculus is formed, if not removed, it will eventually irritate the gums to the point of infection. Calculus, unlike plaque, can be removed only by a dentist or dental hygienist. Calculus formation can be prevented by effectively removing plaque from the teeth.

Diseases of the gums and other supporting structures are called *periodontal disease.* Peridontal disease is the greatest cause of tooth loss.

Healthy gums and tissue are normally pink in color, firm in texture, and fit closely around the teeth. In the early stages of periodontal disease, called *gingivitis,* the gums are red and swollen, bleed easily, and recede from the teeth. Periodontal disease can be caused by accumulation of plaque and calculus, breathing through the mouth, injury, improper brushing, poor nutrition, and some systemic conditions.

Usually, periodontal disease can be eliminated at this stage (gingivitis) by removal of the cause and by proper toothbrushing and cleaning.

Diet and Oral Health

There is evidence of a direct connection between diet and tooth decay and periodontal disease. Just as other parts of the body are affected by proper or improper nutrition, so are the mouth, teeth and gums.

Good nutrition is essential, especially during early childhood when teeth are developing. The teeth begin forming enamel about four months before a child is born, and continue until the child is eight years old. (Exception: Wisdom teeth are not completely formed until approximately 15 years of age.) If a child does not receive proper amounts of the necessary nutrients, especially *calcium,* the enamel will be formed poorly or be pitted. Although calcium is not necessary for tooth formation after eight years, it is necessary for bone and blood maintenance.

Another element for development and maintenance of good oral health is *fluoride.* Fluoride is a colorless, odorless, tasteless mineral, and is found, naturally, in some foods and drinking water. Fluoride makes the tooth enamel more resistant to the acid from plaque.

A person can receive fluoride from several sources: food, water, certain toothpastes, and by application by the dentist. Many communities add fluoride to their water supply. Fluoridation of a community's water supply is a safe, economical and effective way to reduce tooth decay and improve the dental health of its populace.

Fluoride *dentrifices* (toothpastes) have proved beneficial, especially when the water is not fluoridated. A fluoride toothpaste, accepted by the American Dental Association, is a wise choice in deciding which dentifrice to use.

Some experiences suggest that the daily intake of fluoride in tablet or liquid form is a beneficial dietary supplement, especially during the formative years. **This should be done only under the supervision of a physician or dentist.** Daily supplements of fluoride may help some families whose water supplies are not fluoridated, but it is not a substitute for water fluoridation.

Good nutrition for oral health also requires the exclusion of excessive amounts of carbohydrates, especially refined sugars —— like those used for baking and in candy. Excessive amounts of carbohydrates make the teeth more susceptible to decay.

The bacteria in plaque use these sugars readily to form acids. Each time sugar is taken in, there is approximateiy 20 minutes of acid exposure. Therefore, it is better to eat a certain amount of sugar all at once, rather than at different times. The more times the teeth are exposed to the acid made by the plaque bacteria and sugar, the more often the teeth are subjected to the decay process.

There is actually no nutritional justification for a high sugar intake. Sugar is not an essential food; it is not in the Basic Four Food Groups, and it offers no nutrients. It is merely an energy food, (of which Americans get plenty!)

Note: The texture of food is also important; soft foods tend to collect in spaces between the teeth and around the neck of the tooth.

CARING - FOR YOUR HANDICAPPED CHILD'S DENTAL HEALTH

The handicapped child places special demands on those around him/her - for patience, attention, love and work. Dental health is one more important need. And yet, too often, dental care is put aside because of the pressures of more immediate health problems. A healthy mouth is an integral part of total health. It can improve not only eating and speaking, but the child's looks and how s/he feels about him or herself. A diseased mouth can be both physically and psychologically painful.

a. Difficulty in chewing and swallowing can take the pleasure out of eating, and lead to a poor diet.
b. Decayed teeth and swollen, bleeding gums are foul smelling, unhealthy, and often painful to the child.
c. Poor speech can interfere with school work and with making friends.

The handicapped child in particular does not need these additional burdens.

Dental disease is preventable, and preventing disease is especially important for the handicapped. Not only is getting to the dental office harder, but restoring the mouth is often more complicated. Even dentures, the undesirable "last resort," are not always possible for the disabled. The severely retarded and people with uncontrolled muscle movements may never be able to learn to keep a partial or complete denture in place.

Dental problems may be caused by the handicap or its treatment. *(Show slides of dental problems)* Missing teeth and malocclusion (crooked teeth), for example, are often part of Down's Syndrome (mongolism) and cleft palate. Underdeveloped, pitted or irregular enamel (enamel hypoplasia) is common in children with cerebral palsy and those born prematurely. Children with Down's Syndrome are prone to periodontal (gum) disease. Children who have muscle spasms may damage their teeth and gums in falls or by grinding (bruxism). Diabetic children tend to get advanced periodontal (gum) disease at a young age. Because an oral infection can make insulin regulation difficult, it is highly important for a diabetic child to prevent periodontal disease. Prevention requires thorough flossing and brushing every day.

Drug therapy will also affect the child's oral health.

a. Prolonged tetracycline (antibiotic) therapy during tooth development can stain both primary and permanent teeth.
b. Prolonged use of phenytoin (Dilantin), used to control seizures, may cause the gums to grow abnormally over the teeth (gingival hyperplasia) and interfere with chewing.
c. If drugs with a syrup base are given for a long time, the sugar in them can cause extensive tooth decay.
d. Some immunosuppressive drugs (for example, used in the treatment of blood disorders) can cause sores in the mouth.
e. Radiation therapy and prolonged use of some drugs, including tranquilizers and barbiturates, can cause the saliva to dry up. This makes the teeth more prone to decay.
f. Tranquilizers affect both a person's behavior and his/her reaction to other drugs. These reactions may affect the dentist's choices for treating the child.

These drugs need not be stopped. However, because drugs affect the whole child, the dentist should know about all medicines the child is taking.

In spite of these special dental problems, almost all of a handicapped child's oral problems are caused by the diseases that damage anyone's teeth: tooth decay and periodontal (gum) disease. This happens when the teeth are not cleaned and cared for every day. Soon, there is bad breath, and the gums swell and bleed. Eating hot, cold or sweet foods can be painful. The dental pain and disease can increase drooling and even cause the child to limit the kinds of food s/he can eat with comfort. This damage and discomfort can be prevented almost completely with good home and professional care.

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Causes and What You Can Do About Them

Plaque

Plaque is the primary villain in dental disease. It is a sticky, colorless film of harmful bacteria that forms constantly on the teeth. Plaque causes tooth decay (the major cause of tooth loss in children), and periodontal (gum) disease (the major cause of tooth loss in adults). To prevent these dental diseases, plaque must be removed at least once a day by thorough brushing and flossing.

Tooth Susceptibility

Some people's teeth are more susceptible to decay than others. Fluoride makes the teeth less susceptible. Fluoride can be applied in the dental office (in liquids or gels), and it can be used at home (in fluoride mouth rinses, fluoride tablets and accepted fluoride toothpastes). However, teeth are protected best when the fluoride is used daily in fluoridated drinking water.

Another way to protect the teeth is to have the dentist put a coat of plastic on the biting surfaces of the bicuspids and molars. This seals the irregular surfaces (the pits and fissures) that are most likely to decay.

Sugar

Sugar is another major cause of tooth decay. Plaque + sugar = acids. Acids + susceptible tooth = decay. The more often you eat sugar and the longer it stays in your mouth, the more harm it can do. To prevent decay from starting

a. Avoid sweet snacks (including raisins and other dried fruits with their concentrated sticky sugar).
b. Serve few sugary foods and then only with meals.
c. Watch food labels (sucrose, dextrose, corn syrup, and honey are all sugars).
d. Offer substitutes such as nuts, popcorn, cheese, hard boiled eggs, pizza, vegetables, and fresh fruits.
e. Serve milk and unsweetened fruit and vegetable juices instead of sweetened carbonated beverages and fruit drinks.

When you are tempted to indulge a handicapped child by serving sweet snacks, remember you are doing him/her no favor. You are jeopardizing his/her dental health.

How To . . . Brush, Floss, Adapt

Plaque removal is a major weapon for control of both decay and periodontal (gum) disease. The point is to remove the bacteria laden plaque every day. This means thorough brushing at least once a day (more often if the dentist advises) and flossing if at all possible. Careless brushing three, four, or five times a day will not prevent disease.

Brushing

Place the head of your toothbrush alongside the teeth with the bristles at a 45 degree angle to the gum line. Wiggle the bristles back and forth in a short, gentle scrubbing motion. Both inner and outer surfaces of all the teeth as well as the chewing surfaces must be brushed thoroughly. The tip of the toothbrush may be used to clean the inside surfaces of the front teeth. Brush the tongue too.

Dentists recommend a *soft* bristled toothbrush that has a small head and a flat brushing surface. Check and replace worn brushes regularly. Don't use a brush with bristles that are bent or frayed. A worn brush won't remove the plaque well and could harm the gums and other soft tissues. With an electric brush the same careful technique must be used to remove plaque.

Toothbrush should be hung to dry with the head above the stem. Do not use hot water on brush, as this will decrease longevity. Brush should not be stored in a closed container. Brush should be replaced when bristles become worn or frayed. Electric toothbrushes are no more effective than manual ones, but they require less dexterity and are sometimes recommended for chronically ill or handicapped. Mouth should be rinsed —— plain drinking water after a meal when brushing is impossible. Rinsing will remove residual food, but not plaque. Mouthwashes serve no purpose other than to temporarily refresh the mouth. They will not cure the cause of bad breath.

Flossing

Make a circle of floss (either waxed or unwaxed) about ten inches in diameter and tie the ends together. Work the floss gently back and forth between two teeth until it reaches the gum line. Curve the floss into a C shape around the tooth and ease it under the gum until you meet resistance. Then, scrape the floss up and down the side of the tooth. Do not saw! This can cut the gums. Floss both sides of each tooth until all the plaque is gone.

Ask your dentist at what age you should start flossing the child's teeth. Many children begin to learn when they are six or seven.

Some bleeding of the gums may occur the first few times you brush or floss a child's teeth. This is a sign that gum disease has started. As the plaque is broken up and the bacteria is removed, the gums should heal and the bleeding should stop. If it does not do so in a few days, consult the child's dentist.

Is the flossing doing anything? Check for yourself. When you're done, roll the floss up in your hand and sniff. The odor comes from the plaque and debris that was on the teeth. Besides being disease-producing, plaque is a major cause of bad breath.

To make sure that all the harmful plaque has been removed, you should check by using a coloring dye to find the plaque. Disclosing tablets or solutions color the plaque and make it easy to see and remove.

Adapting

These "simple" techniques can be quite hard for the disabled person. Here are some ways to adapt.

Holding the toothbrush

a. Attach the brush to the hand with a wide elastic or Velcro band or with a fingernail brush handle bonded to the toothbrush.
b. Enlarge the handle with a sponge, Styrofoam or rubber ball, bike handle grip, or similar item.
c. Lengthen the handle with a piece of wood or plastic to aid those with limited shoulder movement.
d. Bend the brush handle after warming it. You can vigorously rub the brush for a minute or run hot tap water over the handle (not the head) and then bend it into position.
e. Clamp an electric toothbrush to a low table or back of a chair if the child can stand. The child may then be able to help brush his/her own teeth by leaning over.

Holding the floss

Manipulating floss is a difficult skill even for the non-handicapped. It has to be learned and practiced. For those who do not have the manual dexterity or who need assistance, a commercial floss holder can be a valuable aid. It is especially important to use the floss carefully, making a C shape around the tooth. Don't snap the floss. This can cut the gums. Ask the dental staff for more instruction.

Holding the child

If the handicapped child is unable to clean his/her teeth effectively alone, you can use one of the

following positions:

a. Stand behind the child while s/he is seated in a chair and use your arm to hold the child's head against the chair or your body. A pillow behind his/her head may be used for more comfort. The child's head should be tilted back to clean the upper teeth.
b. Sit in a chair and have the child sit on the floor with his/her back to you. Th support the head and shoulders with your knees.
c. Have the child lie on the floor or on a bed while you sit next to his/her head. A bean bag chair can both support a child and allow him/her to relax without fear of falling. If his/her arm or body movements must be controlled, you can lean forward with one arm across the child's chest.
d. The child may lie down with his/her head on your lap. If a small child has trouble with uncontrolled movements, two people can sit facing each other with the child placed between them. One person can then hold the child.

People who have involuntary muscle spasms will often need a prop to help them keep the mouth open. Use a rubber mouth prop or tape several tongue blades together to use between the teeth.

If the child is leaning back while you help him/her, be careful s/he doesn't gag or choke. Don't use toothpaste in this position. Simply brush the teeth with a brush that is rinsed often. After the teeth are clean, put a little fluoride toothpaste on the brush and use it over the teeth. This will give the teeth some of the fluoride protection they need to prevent decay.

While each of these techniques is time consuming, repair of a diseased mouth takes more time and is more costly both monetarily and psychologically. When you take the time, you know you are providing the best form of health care - prevention.

Special Considerations

Some children present special problems. For example, if the lips are very tight (as in some children with cleft lip or palate) it will take more practice to learn to hold the lips open to brush the teeth.

There may be a reluctance to clean the mouth of a child with a cleft palate for fear of bumping and further injuring the mouth. This injury is very unlikely. Not cleaning the plaque off the teeth however, can be quite harmful.

Some people are hesitant to clean the mouth of a child with hemophilia for fear of starting bleeding. Again, treatment of dental disease is far more difficult than prevention.

The Dental Office

(refer to Transparency 3)

The dentist and dental staff will also adapt to the handicapped person. The examination area may be modified to accommodate a wheel chair. A child with involuntary muscle spasms may be seated on cushions in the dental chair to help him/her feel secure. A parent may hold a very young child on his/her lap during treatment.

Frequently stabilizer straps or a papoose-style wrap is used for support. Let the child know that the straps are not for restraint but rather to help him/her help the dentist.

Mouth props to help the child hold his/her mouth open and finger guards to protect the dentist are common.

Dental care and instruction may take place in very short segments both to keep the child's attention and to help him/her feel less afraid of this new experience. If a child has trouble speaking, seeing or hearing, the dental staff may need to take more time to instruct him/her. Other treatment may be done all at once with a general anesthetic in a hospital operating room.

Because preventing disease is so important, professional dental care and instruction should be started earlier (before 2 years of age) and rescheduled more often than for other children. Many dentists wish to work with the medical team as soon as the child is born. Children are different, however, and so the dental staff will work with each one individually.

First Aid for Dental Emergencies

The following information is to be used as a guide for simple procedures in dental emergencies. The procedures are to provide comfort, if possible, to the student until seen by the dentist.

Medicine Chest Contents

1. **Medications**
   a. Oil of Cloves (Eugenol Oil)
   b. Antiseptics
   c. Aspirin (Children's)
   d. Salt
   e. APC
   f. Hydrogen Peroxide Solution (3%)

2. **Instruments**
   a. Tweezers

3. **Other Items**
   a. Cotton
   b. Gauze——Sterile
   c. Swabs——Cotton or Q-tips
   d. Stimudents or toothpicks
   e. Dental floss or dental tape
   f. Plastic drinking container
   g. Spoon (Teaspoon)

Emergency Procedure for ——

1. **Toothache —— Do's**
   a. Determine tooth or teeth causing trouble.
   b. Clean out debris in cavity of tooth or teeth with dental floss, toothpick, or both, and flush the mouth vigorously with warm water.
   c. Place pellet of cotton dipped into Oil of Cloves in cavity of tooth.
   d. If swelling is present, apply cold compresses to outside of cheek next to area.
   e. If necessary, give child two aspirin.

Toothache —— Do Not's

   a. Do not place an aspirin on gum tissue next to aching tooth or teeth.
   b. Do not place an aspirin in cavity of tooth or teeth causing trouble.

Emergency Procedure For ——

2. **Gum Tissues**
   a. If gum tissues are swollen and sore, rinse mouth several times a day with warm water and salt (glass of warm water and 1/4 teaspoon of salt, mixed).
   b. Try to keep gum tissues clean by brushing teeth after eating with light strokes of the toothbrush.
   c. Rinse area with Hydrogen Peroxide Solution diluted with equal amount of water.
   d. After extractions ——
      1. Keep area clean with warm water mouth rinses after eating.
      2. If bleeding continues or starts again ——
         (a) place a sterile gauze pad on area and have the child bite hard with continuous pressure.

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(b) keep biting for several minutes.
(c) replace sterile gauze pad when soaked.
(d) apply cold compress to outside of cheek next to area of bleeding until bleeding stops.
(e) if due to orthodontic (braces) appliances, some relief may be given by holding warm salt water in mouth, tipping the head to hold it on the involved area.
(f) two aspirin or APC may be given for pain in any condition as prescribed by the dentist.

Emergency Procedure For —

3. Tooth — Fractured (Broken)

a. Try and clean face of dirt and blood, if possible.
b. Place ice-cold or cold compresses on face next to fractured tooth to minimize swelling.
c. Have child close mouth. Observe teeth and if the tooth or teeth have been displaced, try to move gently back into alignment with other teeth.
d. If necessary for pain, give child an aspirin or APC tablet.

4. Tooth — Knocked Out

a. Look for same in accident area.
b. If found, place in glass of water or wrap in wet towel or gauze. Note: Do not attempt to wash or clean tooth.
c. Take tooth and patient to dentist immediately.
d. If necessary for pain, give child an aspirin or APC tablet.

Emergency Procedure For —

5. Possible Jaw Fracture

a. If suspected, immobilize jaw by any means — handkerchief, towel, belt, or any available means.
b. Take child to the dentist or hospital.

6. Orthodontics (Braces)

a. Any wire that is causing irritation to the mouth, you may
   1. Take a blunt end item (pencil, eraser, orange-wood stick, tongue depressor, etc.,) and push gently against the offending wire until irritation is removed.
   2. If the wire cannot be bent or moved, cover the end of the wire with a small moist cotton ball, a folded piece of gauze, a piece of soft beeswax, or even chewing gum.
   3. If a wire is imbedded in the cheek, tongue, or gum tissue, do not attempt to free it. See orthodontist immediately.
b. Painful swelling of gum tissue.
c. Loose or broken appliance — if the piece can *easily* be removed, do so, place in envelope, and bring to the orthodontist.
d. Tender or hurting teeth are sometimes experienced for two or three days following placement or adjustment of appliances. Aspirin may be given and the patient should be instructed to stay on a semi-solid diet until discomfort is gone.

Summary

Your actions can prevent most dental disease:

1. Avoid sweet snacks.
2. Use fluorides.
3. Clean the plaque off daily.
4. Start the child's dental visits early.

If you must care for a dependent child's dental needs, you can enjoy the satisfaction of seeing

your efforts dramatically improve his/her health. Swollen gums return to normal, there is less decay, and the child will need fewer fillings. You can prevent the extra handicap of chronic dental destruction.

By its nature, dental care is highly personal. It requires touching and personal attention. For the parent or teacher it can be one of the few active ways to show love and concern for the child and see visible results. It is work but it is also an area where your individual effort can improve health . . . and bring a smile.

10 min. Pretest

Roles & Responsibilities of the Teacher

10 min. 1. *Need for Training.* Since the teacher is present when the child has either a medical emergency or a traumatic accident, it is critical to know what to do and who to call.

a. The teacher has the responsibility to care for the child and is protected by the Good Samaritan Law.

1) 613.17 EMERGENCY ASSISTANCE IN AN ACCIDENT. Any person, who in good faith renders emergency care or assistance without compensation at the place of an emergency or accident, shall not be liable for any civil damages for acts or omissions unless such acts or omissions constitute recklessness. (C71, 73, 75, 613.17)

b. The teacher has a responsibility to notify authorities of suspected child abuse (physical and mental).

c. The teacher must be knowledgeable about when the child should see a physician.

Equipment Aid Kit

10 min. 1. Need for aid kit and deficiencies of pre-packaged units.

a. Introduce materials listed below by showing them to the class and explaining their general uses.

Quantity	Equipment	Prices
1 Pack	Airways	$11.40
6	Triangular Bandage @1.25	7.50
12	5" x 9" Dressing	4.25
1 Pack	4" x 4" Dressing	2.55
1 Pack	3" Kling Bandage	5.05
1 Pack	Kwik Kold	4.25
3 Rolls	1" Tape @ 1.30	3.90
6	Bath Towels	$31.90

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Prevention

5 min. 1. The teacher should be constantly aware of conditions which might lead to injury of a child.

a. Equipment which is too high for the child to safely retrieve.

b. Equipment which the child should not have access to, should be locked up or in an appropriate storage area.

c. Equipment should not be heavy, sharp or unsteady in areas where the child cannot protect him or herself.

d. The teacher should be aware of hot liquids, chemicals and poisonous plants.

e. Do not make use of extension cords. If necessary, they should be covered, not running long distances or under rugs.

Notification

5 min. 1. It is most important that the teacher knows how to call for help.

a. The doctor should *not* be called.

b. An ambulance *should* be called.

1) An ambulance phone number should be handy.

2) The caller should keep calm.

3) The caller should identify him or herself.

4) The situation should be described.

a) Event
b) Condition
c) Location

5) The caller should wait on the line to see if the dispatcher needs more information.

Patient Transport

It is important that the teacher or school officials *NOT* transport anyone to the hospital. *Call an Ambulance!*

5 min. 1. The child could become arrested or critically worse.

a. There would be no way to call for help.

b. There would be no immediate help available.

c. An accident could occur with attention being divided between a sick child and driving.

Signs, Symptoms and Treatment

55 min. **Shock, "The Silent Killer"**

1. Shock is caused by collapse of the cardiovascular system.

a. Loss of blood.

b. Loss of pressure due to dilation of vessels.

c. Loss of pressure due to coronary failure.

1) Hemorrhagic

2) Respiratory

3) Neurogenic

4) Psychogenic

5) Cardiogenic

6) Septic

7) Anaphalactic

8) Metabolic

2. Signs and symptoms of shock.

a. Restlessness and anxiety

b. Weak and rapid pulse

c. Cold and clammy skin

d. Profuse sweating

e. Cyanotic (blue) face

f. Shallow respirations

g. Dull and lusterless eyes

h. Thirst

i. Nausea

j. Swollen face and tongue

3. Treatment and prevention of shock.

a. Maintain an airway

b. Control bleeding

c. Elevate lower extremities if not contraindicated

d. Splint fractures

e. Avoid rough handling

f. Prevent the loss of body heat

g. Keep patient supine if not contraindicated

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h. *Do Not* give the patient anything to drink

Bleeding

1. External bleeding.
   a. Types of injuries to soft tissues.
      1) Abrasions
      2) Lacerations
      3) Avulsions
      4) Contusions
      5) Punctures
   b. Methods used to stop external bleeding.
      1) Direct pressure
      2) Pressure point
      3) Tourniquet
   c. Keep avulsed parts and keep cool and moist
2. Internal bleeding "Silent Killer".
   a. Weak and rapid pulse
   b. Cold and clammy skin
   c. Dull eyes
   d. Thirst
   e. Nausea
3. Causes of internal bleeding.
   a. Head injury from blow to the head
   b. Ulcers (stomach)
   c. Closed fracture with excessive blood loss within the tissue
   d. Lacerated liver and spleen from blow to abdomen
4. Treatment for internal bleeding.
   a. Refer to treatment for shock

10 min. **Epilepsy**

1. Seizures are caused when the brain cells discharge abnormally.

2. Epilepsy can result from defects in the brain, brain injury before, during or after birth, head wounds, chemical imbalance, poor nutrition, childhood fevers, some infectious diseases, brain tumors, and some poisons.

3. What epilepsy is *not.*

   a. Contagious
   b. Hereditary

4. There is no cure for epilepsy but it may be controlled.

   a. Surgery
   b. Medication

5. Treatment for the person having a seizure.

   a. Keep calm (you can't stop it.)
   b. If not severe (grand mal) *do not* restrain the person.
   c. Clear the area around person so s/he doesn't injure self.
   d. Try not to interfere with movements in any way.
   e. *Do Not* force anything between the teeth.
   f. If the mouth is open you may place a soft object between the side teeth.
   g. Turn the person on his/her side.
   h. Remove all others from the area if warranted.
   i. Let the person rest.

6. Medical Alert

   a. The purpose is to provide the unconscious person with a means of communication of known medical problems or allergies which would either help diagnosis and/or treatment.

   b. It is found in three places.

      1) Necklace
      2) Bracelet
      3) Billfold or purse

   c. Look for it on any unconscious person.

30 min. **Fractures and Dislocations**

1. What are the two types of fractures?

   a. Open (breaking the skin)
   b. Closed (contained within the skin)

2. Signs of a fracture.

   a. Deformity.

b. Pain to touch.
c. Grating when moved.
d. Patient indicated something popped.

3. Treatment for fractures.

a. Splint them where they lie.
b. Splint the fracture in the position in which it is found.
c. Do not move until splinted.
d. Treat for shock.

4. Signs of a dislocation.

a. Deformity of a joint.
b. A joint which is locked and cannot be moved.

5. Treatment for dislocations.

a. Do not attempt to move or straighten.
b. Splint in position found.

6. What you can do for fractures of the major part of the skeletal system.

a. Upper extremity.

1) Splint with sling
2) Splint alone

b. Lower extremity.

1) Splints can rarely be applied adequately by anyone unless commercially produced splints are used.
2) Keep the patient still.

c. Neck and back injuries.

1) *Do Not* allow the patient to move or be moved.
2) Proper splinting can be done by using backboards or other commercial devices designed to splint with minimal movement of the patient.

15 min.

Patient Examination

1. Airway
2. Circulation
3. Bleeding (severe)
4. Start at the head and move downward looking for signs of
   a. Bleeding
   b. Fractures
5. Check for medical alert
6. Skin color
7. Temperature

30 min. **Practice in the Following Areas:**

1. Bandaging
2. Reading of thermometer
3. Splinting and sling

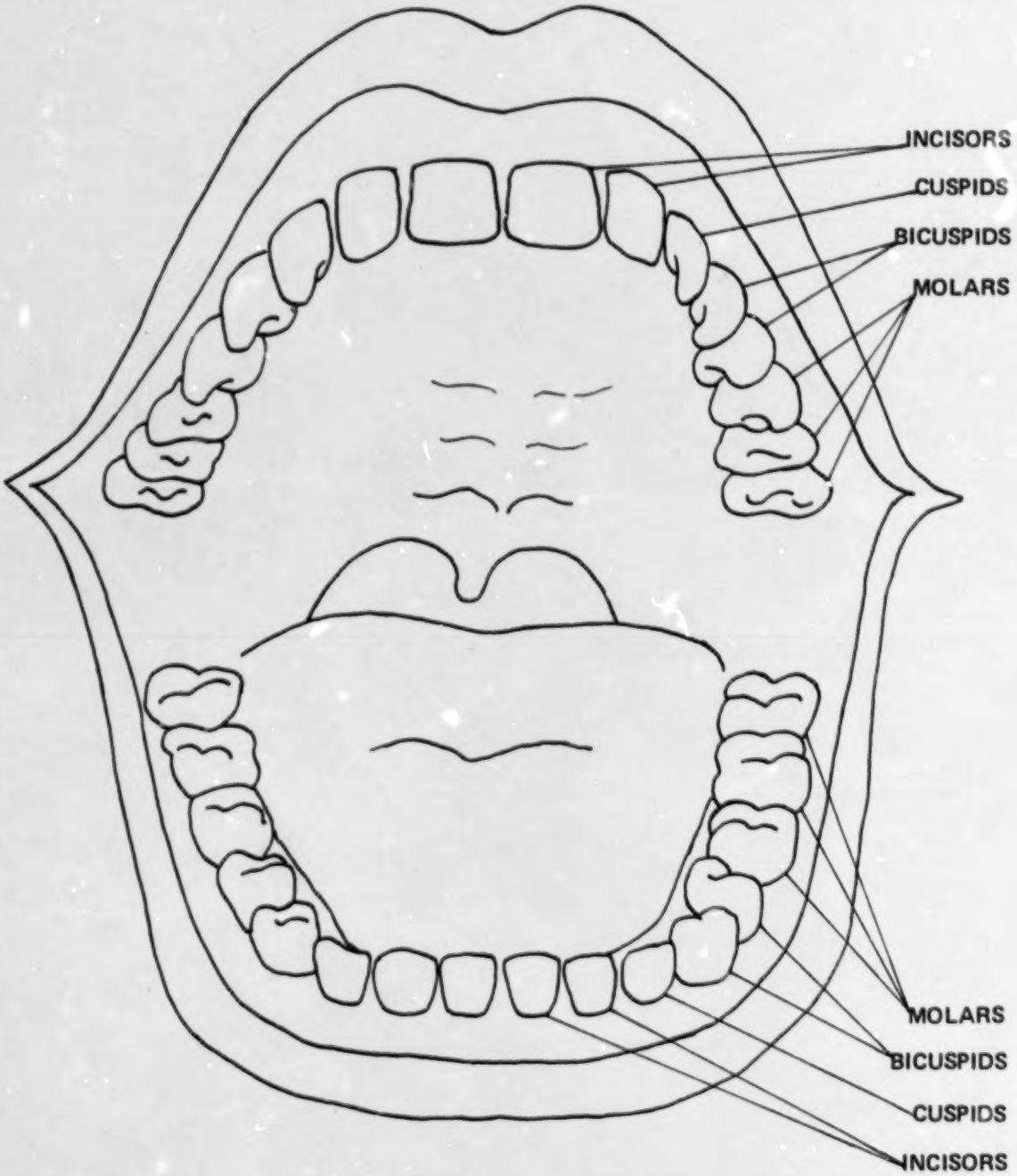
Questions

10 min. Post-test

DENTAL PROBLEMS

Order of Slides

1. Normal (ideal) gingiva
2. Marginal gingivitis
3. Periodontitis (gums and bone)
4. Mild decay
5. Moderate decay
6. Severe decay
7. Macro slide of plaque
   - in mouth in clinical setting
   - as disclosed clinical entity
8. Hereditary problems
   - hypo-calcification
   - hypo-plasice
9. Malocclusions
   - normal occlusions
   - class 2 occlusions
   - class 3 occlusions
10. Typical Down's Syndrome
11. Cerebral Plasy
12. Cleft palate
13. Clinical conditions as a result of medications (Dilantin)


INCISORS
CUSPIDS
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MOLARS
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BICUSPIDS
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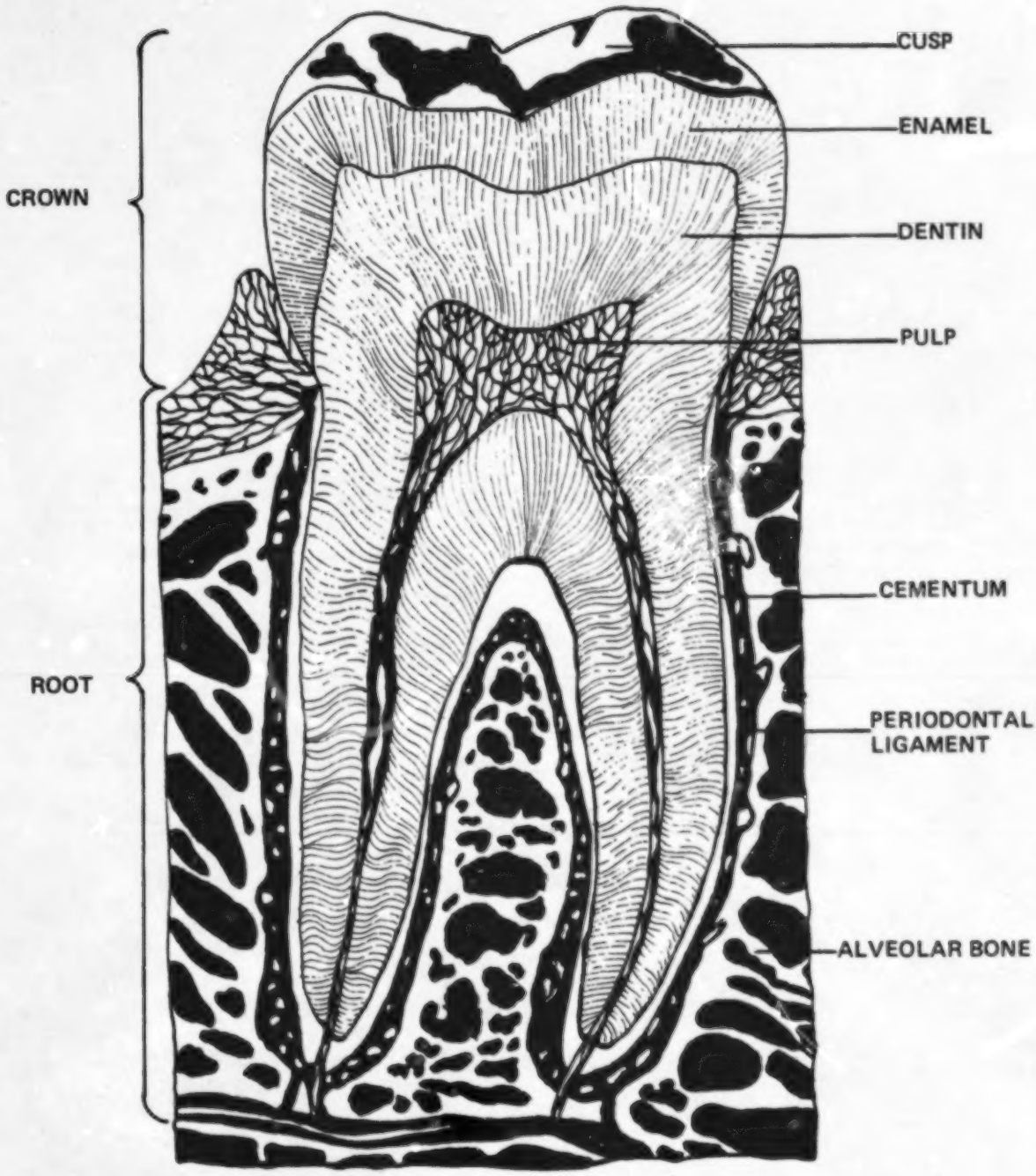
Transparency 2



THE DENTAL HEALTH TEAM

DENTIST:

The dentist diagnoses and treats dental disease and oral conditions, restores decayed teeth, replaces lost teeth, performs oral surgery, and stresses prevention of dental and peridontal disease.

DENTAL HYGIENIST:

Under the supervision of the dentist, the dental hygienist performs examinations, cleans teeth, applies fluoride, takes x-rays, serves as community resource person on dental health, educates patients on preventing dental and peridontal disease.

DENTAL ASSISTANT:

Under the supervision of a dentist, the dental assistant prepares the patient for treatment, prepares restorative materials, assists the dentist with instruments and x-rays and instructs the patient in good oral hygiene.

DENTAL LABORATORY TECHNICIAN:

The dental technician under supervision of a dentist makes and repairs dentures (false teeth), crowns, bridges and inlays, all of which require painstaking craftsmanship and skill.

YOU:

The ultimate responsibility for maintaining good oral health lies with you. You are the most important member of the health team. Without your cooperation, the other four members of the team can do very little to prevent dental and periodontal disease and maintain good oral health.

HELP

If you need information or help in locating a dentist who works with handicapped individuals, several groups may be of help:

Academy of Dentistry for the Handicapped
1240 East Main Street, Springfield, Ohio 45503.

American Dental Association
211 East Chicago Avenue, Chicago, Illinois 60611.

Dental Guidance Council for Cerebral Palsy
122 East 23rd Street, New York, N.Y. 10010

National Foundation of Dentistry for the Handicapped
1121 Broadway, Suite 5, Boulder, Colorado 80302.

Your local dental society
(check in your phone book or write to the American Dental Association for the address of the dental society near you).

RULES OF SPECIAL EDUCATION

12.29 (4) Medications. Each school district and area education agency shall establish written policies concerning the administration of prescribed medication by school personnel during school hours. The following requirements shall be met:

a. A statement of the physician's directions specifying frequency, amount, and method of administration signed by the prescribing physician, must be filed at the school.

b. A physician's description of anticipated reactions of the pupil to medication must be filed at the school.

c. The medicine shall be maintained in the original prescription container which shall be labeled with:

(1) Name of pupil.
(2) Name of medication.
(3) Directions for use.
(4) Name of physician.
(5) Name and address of pharmacy.
(6) Date of prescription.

d. A record of each time medication is administered shall be maintained to include the pupil's name, date, time, and person administering the medication.

e. A parental signature on a statement requesting and authorizing school personnel to administer the medicine in accord with the prescription.

f. Each school or facility shall have designated in writing, specific locked and limited access spaces within each building to store pupil medication.

(1) In each building that houses a full-time registered nurse, access to medication locked in a designated space shall be under the authority of the nurse.

(2) In each building that houses a less than full-time registered nurse, access to the medication shall be under the authority of the principal.

g. The person responsible for administering the medication shall have ready access to the information regarding the medication filed at the school.

From Rules of Special Education, Iowa Department of Public Instruction, 1977, p. 27.

TEACHERS AND ADMINISTRATORS LIABLE FOR FAILING TO REPORT SUSPECTED CHILD ABUSE

Effective July 1, 1974, the State Law of Iowa requires certificated school employees, registered nurses and licensed practical nurses to report to the Department of Social Services all instances of suspected child abuse involving students. Any school nurse or certificated school employee who is found guilty of knowingly and willfully failing to report suspected cases of child abuse is subject to a fine of $100 and imprisonment of up to ten days. Civil liability may also be imposed for the damages caused by failure to report suspected child abuse. Thus, a failure to report which results in further abuse or death may cause a school nurse or certificated employee to be found liable for such things as medical expenses and a loss of future income.

Immunity from suit for such actions as slander and libel is extended to those making reports in good faith. Photographs are encouraged and reimbursement may be made from public funds.

Child abuse is defined as non-accidental physical injury suffered by a person under 18 years of age resulting from acts or omissions of parents, guardians or persons legally responsible for the child.

Each school district should designate administrative personnel responsible for making the reports of suspected child abuse to the State Department of Social Services or its subdivisions. School nurses and certificated employees are to report suspicion of child abuse to the designated person who shall make an immediate oral report to the Department of Social Services.

Each oral report is to be followed by a written report within forty-eight hours.

Each report should contain as much of the following information as can be obtained within the time limit:

* name, age, address of the suspected abused child.
* name, address of parents, guardians or person legally responsible for his/her care.
* description of injuries, including evidence of previous injuries.
* name, age and condition of other children in the home.
* the child's whereabouts if different from parents', guardians', or person's legally responsible for the child.
* any other information considered helpful.
* name, address of person making the report.

Senate File 1225, Amendment to Chapter 235, Child Abuse, Code of Iowa.

APPROPRIATE RESPONSES TO SEIZURES

The following steps represent a general outline of procedures to be followed should a seizure occur in your presence. Specific procedures should be discussed with the parents and physician of any student whom you will be serving.

1. Note time at which the seizure occurs.
2. Help the student to a safe position, usually on abdomen on the floor.
3. Remove all objects in the immediate area.
4. Remove food or object from mouth if possible——be very careful of your fingers.
5. Do not restrain the student's movements.
6. Remain with the student. If possible, have someone notify the school nurse.
7. Observe the seizure carefully so that an accurate description can be recorded. Note time when seizure activity stops.
8. If the seizure lasts for more than five minutes, seek immediate medical aid.
9. If necessary, allow the student time to sleep or rest following the seizure.
10. Check the student for injuries that may have occurred during the seizure.
11. Write a description of the seizure and give it to the appropriate medical personnel.

DENTAL VOCABULARY LIST

Bicuspid
A tooth with two cusps or points used for crushing food. There are eight bicuspids.

Calculus
A mineral formation on teeth consisting of salivary deposits of calcium phosphate and carbonate with organic matter.

Cementum
The hard covering for the root of the tooth.

Crown
The section of the tooth that can be seen above the gum line.

Cuspid
A tooth in the front corners of the mouth which break and tear food (canines). These are four cuspids, two in the upper jaw and two in the lower jaw.

Deciduous tooth
A primary or baby tooth. It will get loose, come out, and be replaced by a permanent tooth.

Dental floss
A string used to scrape plaque from the surfaces of the tooth which cannot be reached by a toothbrush, in between the teeth.

Dentifrice
Toothpaste used to clean the teeth when using a toothbrush.

Dentin
The layer of tooth just under the enamel of the crown and the cementum of the root. The color of a tooth is determined by the color of the dentin.

Disclosing tablet
A red vegetable coloring tablet used to stain plaque red so that it can be seen on the tooth.

Enamel
The hard shiny covering for the crown of the tooth. It is the hardest substance in the body.

Filling
A patch made of a mixture of silver and other metals which is used to fill a cavity in a tooth.

Fluoride
A chemical compound which is a dietary essential for optimum health. Fluoride changes the chemical structure of the tooth and makes it more resistant to acid produced by plaque. Fluoride for dental health can be obtained from the supply of drinking water, by special applications by a dentist or a dental hygienist, and by brushing with a toothpaste that contains fluoride.

Gingiva
The gums of the mouth.

Gingivitis
An inflammation involving the gingival tissue only.

Gums
The soft tissue that covers the part of the jawbone where the teeth are embedded.

Incisor
A tooth in front of the mouth which can cut like scissors. There are eight incisors, four in the upper jaw and four in the lower jaw.

Malocclusion
Irregularities in teeth and jaw position that prevent upper and lower teeth from coming together in proper alignment.

Mastication
Chewing the food in preparation for swallowing.

Molar
A large tooth with two cusps or points used for grinding food. There are twelve molars.

Occlusion
Proper alignment of the teeth and jaw.

Orthodontist
A dentist who specializes in correcting crooked teeth.

Periodontal Disease
A disease caused by plaque which attacks the gums, and if allowed to continue, will eventually destroy the periodontal membrane and jawbone. Bleeding gums are common but there may be no pain at all until the disease is advanced.

Periodontal membrane
The ligament that attaches the cementum of the root to the jawbone.

Periodontist
A dentist who specializes in the prevention and treatment of diseases which affect the supporting tissues of the teeth.

Permanent teeth
The teeth which will not be replaced by the growth of new teeth.

Plaque
Bacteria in the mouth which have grown into a harmful sticky mass.

Primary teeth (baby teeth)
The first set of natural teeth; which are very important in the future alignment of the permanent teeth, digestion, and the development of the child's jaws.

Pulp
The soft center of the tooth. The pulp contains nerves and blood vessels.

Root
The section of the tooth held firmly in place below the gum line in the jawbone.

Sulcus
The linear depression or valley between the surfaces of the teeth.

Sulcular brushing

A brushing technique which provides for the removal of plaque from the sulcus by placing the brush at a 45 degree angle at the gum line and vibrating the bristles back and forth using short strokes.

Tartar

The same as calculus.

Tooth decay

A disease of the tooth caused by plaque. The plaque gives off an acid waste product especially after the plaque bacteria have ingested sucrose. Destruction takes place in the enamel and then the dentin and can eventually reach the pulp; abcess and severe pain result.

Water fluoridation

The addition of fluoride to public water supply; a public health program to reduce or prevent the incidence of dental caries.

HEALTH CARE NEEDS
Pre/post Test

1. List six major factors that should be observed and communicated to parents concerning seizure activity during school hours.

2. List the basic side effects of four of the following common medications used for seizure control.
   Dilantin-
   Mysoline-
   Celantin-
   Mesantoin-
   Milantin-
   Tridione-
   Mebaral-
   Phenobarbital-

3. List five purposes for which medications are given.

4. List four types of seizures and describe each one.

5. List nine body systems.

HEALTH CARE NEEDS

Pre/Post Test Key

1. The time of day it occurs.
   The number of seconds during the unconscious state.
   What activity the child was doing just prior to the onset of the seizure.
   Characteristics noted during the seizure.
   What activity followed the seizure.
   Complaints of pain and locations of the pain.

2. Dilantin-Hyperplasia of gums
   - drowsiness
   - nervousness
   - dizziness
   - loss of muscle coordination and blurred vision

   Mysoline-sedation
   - fatigue
   - hyperirritability

   Celantin-drowsiness
   - atoxia
   - dizziness
   - irritability

   Mesantoin-drowsiness
   - atoxia
   - diplopia
   - fatigue
   - irritability
   - depression

   Melantin-drowsiness
   - dizziness
   - atoxia
   - lethargy

   Tridione-drowsiness
   - irritability
   - fatigue
   - skin rashes
   - bleeding gums

   Mebaral-drowsiness
   - lethargy

   Phenobarbital-drowsiness
   - lethargy
   - skin hypersensitivity
   - fatigue
   - atoxia
   - constipation
   - depression
   - nausea
   - blurred vision
   - insomnia
   - tremor

3. Maintain health
   Prevent disease
   Relieve symptoms
   Supply a body need
   Cure disease

4. Grand Mal-loss of consciousness (loss of speech)
   Muscles tighten
   Fall to floor or ground
   May cry out or groan although s/he is not in pain
   Excess saliva——no swallowing
   Labored breathing, blowing, or snorting
   Face may be first dusky, then pale
   Rolling of eyes
   Violent twitching for 45-60 seconds (seems much longer to worried bystander)
   Oxygen deficiency——blue lips
   May be incontinent
   May sleep heavily for hours or may get up but feel dull for short period, have headache, or s/he may immediately return to normal self.

Petit Mal (pronounced "petty-mahl"): These occur much more frequently and are often overlooked because they last only a few seconds. Petit mal seizures may consist of:
   Brief or blank stare——may be accompanied by:
   Rhythmic twitching of eyelids or eyebrows
   May stop in middle of sentence (or at work) stare vacantly, blink, then go on seemingly not at all confused. (Parents often disregard petit mal attacks in childhood, supposing they will eventually disappear and usually do. However, out of a large group studied, one out of three with petit mal later develop grand mal.
   May fall, but generally not.
   Most common in childhood or adolescence.
   They are not unconscious; rather have impairment of the conscious state.

Psychomotor. This is most difficult to diagnose because the attacks vary greatly from one person to another, and because the mild form may look like petit mal and the severe form resembles grand mal. This type of seizure occurs in approximately one third of adult epileptics.
   Unaware of what is going on (not always unconscious)
   May appear to be conscious, but does not later remember anything that happened.
   May appear to be a temper tantrum; wandering about room, pulling down pictures, throwing books, knocking over furniture.
   Chewing, smacking lips
   Raging; may attack
   Searching movements
   Opening and shutting or slamming doors
   Confused and very worried

(May show one or more of these, but not likely all in one person or at the same time. Men are more prone to this type than women.)

Jacksonian. Named after the neurologist who first described it.

Modified grand mal. In first part:
   Person remains conscious.
   Twitching or numbness of one leg or arm or side of face or trunk; gradually spreads to include greater portion of body.
   Often becomes unconscious late in attack. Indicates that attack arises in certain part of brain's surface, opposite to side of body in which attack begins. Means that something——tumor or scars——is irritating brain at this point. In some cases surgical removal may be recommended.

5. Skeletal System
   Muscular System
   Nervous System
   Respiratory System
   Circulatory System
   Digestive System
   Genitourinary System
   Endocrine System
   Integumentary System

DENTAL CARE

Pre/Post Test

1. Tooth decay can be prevented by drinking lots of milk. T F
2. Dental plaque forms as a result of eating food. T F
3. A toothbrush and dental floss are both necessary for effective plaque removal. T F
4. Eating crisp foods helps keep the teeth clean. T F
5. No matter what they do, most people will lose most of their teeth by age 65. T F
6. If your gums bleed when you clean your teeth, it is a sign of disease. T F
7. It is as important to care for primary teeth as it is to preserve the permanent teeth. T F
8. A child's first dental visit should take place when s/he starts kindergarten. T F
9. Fluoride is a natural substance which helps prevent tooth decay. T F
10. Nothing can be done to save a tooth that has been knocked out. T F

DENTAL CARE
Pre/Post Test Key

1. *Tooth decay can be prevented by drinking lots of milk.*

False. Milk is a fine source of calcium, which is essential to the development of tooth structure. However, once development is complete and teeth have appeared in the mouth, they cannot absorb more calcium. So even though milk is an important source of calcium for other body parts, it does not prevent tooth decay.

However, tooth decay *can* be prevented. Most of you are aware that brushing and flossing your teeth will make your mouth feel fresh, look attractive, and smell pleasant. But did you know that brushing and flossing also removes plaque and that's a very important way to prevent tooth decay. Plaque is a clear, sticky substance which constantly forms on your teeth. When you eat foods containing sugar, the sugar mixes with the bacteria in plaque and together the sugar and bacteria form an acid. The acid attacks the tooth surface and that begins the decay process. Weapons to use against the acid attacks are your brush and floss. Brushing and flossing will remove food and debris in your mouth and disrupt the colonies of plaque.

2. *Dental plaque forms as a result of eating food.*

False. Dental plaque forms constantly, even when no food is eaten. Plaque becomes a problem when it has an opportunity to mix with sugars from the foods you eat to form a decay-producing acid.

3. *A toothbrush and dental floss are both necessary for effective plaque removal.*

True. In order to effectively remove plaque and food debris, it is important to reach all the surfaces of the teeth. Since the toothbrush cannot reach in between areas of the teeth, floss must be used. (If possible, provide a brushing and flossing demonstration.)

4. *Eating crisp foods helps keep the teeth clean.*

Even though many people think that eating crisp foods such as apples, carrots and celery will help clean the teeth, this is a false statement. Only proper brushing and flossing can remove plaque, crisp foods cannot.

5. *No matter what they do, most people will lose most of their teeth by age 65.*

False. Your teeth, just like other parts of your body, are meant to last a lifetime. With proper personal and professional care, most people can keep their teeth all their lives. Professional care involves regular visits to your dentist. S/he can suggest the best ways for you to brush and floss your teeth, answer questions you may have, and detect areas of decay before they progress too far.

6. *If your gums bleed when you clean your teeth, it is a sign of disease.*

True. Bleeding gums when you brush and floss your teeth is an early sign of periodontal (gum) disease.
True. Bleeding gums when you brush and floss your teeth is an early sign of periodontal (gum) disease. Periodontal disease results when plaque is not removed. So, you see, plaque not only has a role in tooth decay but also in periodontal disease. When plaque is not removed it can harden into a material called calculus. As more plaque builds up on top of the calculus, the gums become irritated. Brushing and using dental floss daily will help keep the plaque from accumulating and causing damage to your gums. However, neither toothbrushing nor flossing can remove calculus. Once it's formed, only a dentist or dental hygienist can remove it.

7. *It is as important to care for primary teeth as it is to preserve the permanent teeth.*

True. Although they remain in the mouth only a few years, primary teeth are needed for chewing, proper speech, appearance, and as guides for the permanent teeth.

8. *A child's first dental visit should take place when s/he starts kindergarten.*

False. Children should begin dental visits when they are about two, to promote positive attitudes toward dental care and to prevent serious problems from developing.

9. *Fluoride is a natural substance which helps prevent tooth decay.*

True. Fluoride is a natural substance found in many foods and water supplies, in various amounts. When the community water supply contains one part per million of fluoride, teeth of people who drink it from birth have about two-thirds fewer cavities than those of people drinking water not containing an adequate amount of fluoride. Fluoride is built into the enamel of the teeth so that they become more resistant to decay. Several fluoride toothpastes accepted by the American Dental Association have also been found to prevent tooth decay by strengthening the enamel's resistance. These brands show the ADA seal or statement on their box or tube.

10. *Nothing can be done to save a tooth that has been knocked out.*

False. If treatment is undertaken immediately, a dentist may be able to replace such a tooth in the jaw.

EMERGENCY CARE

Pre/Post Test

1. Teachers are most likely to be held liable for emergency care provided by them at school. T F
2. Teachers are required to report any suspected child abuse case. T F
3. The school nurse and principal must be consulted before an ambulance is called. T F
4. The best method of controlling bleeding is direct pressure. T F
5. Internal bleeding can sometimes be detected by a layman. T F
6. Shock is generally described as the collapse of the cardiovascular system. T F
7. A spoon or other instrument should be used to force the mouth open of a person who is having a seizure. T F
8. Epilepsy is not hereditary. T F
9. Open fractures should be reduced before splinting. T F
10. In any extreme emergency you should call the student's physician first. T F
11. Pressure points are areas of the body which when pressure is applied the pain would be reduced. T F
12. The best position to lay children when they are ill is flat on their backs. T F
13. Shock cannot be prevented by laymen. T F
14. Bleeding which is bright red and spurting indicates a severed artery. T F
15. Medical Alert is used only for allergic reactions. T F
16. One of the signs of a fracture is a rigid limb. T F
17. The Good Samaritan Law does not cover teachers. T F
18. Children who strike their heads hard enough to raise a lump merely need an ice pack applied. T F
19. Ice can be placed directly to the injured area. T F
20. The teacher or nurse should splint fractures of the lower extremity. T F

EMERGENCY CARE

(Pre/Post Test Key)

1. F
2. T
3. F
4. T
5. T
6. T
7. F
8. T
9. F
10. F
11. F
12. F
13. F
14. T
15. F
16. F
17. F
18. F
19. F
20. F

Bibliography

Basic Life Support

Iowa Heart Association, 3810 Ingersoll, Des Moines, Iowa 50312
(515) 277-6371
American Red Cross, 2116 Grand, Des Moines, Iowa 50312
(515) 243-7681

Dentistry

Pamphlets

"Caring———for Your Handicapped Child's Dental Health" (S6) American Dental Association (211 East Chicago Avenue, Chicago, Illinois 60611) single copy free.

"Dental Care for the Handicapped Child" (A191) National Easter Seal Society for Crippled Children and Adults (2023 W. Ogden Avenue, Chicago, Illinois 60612); $.10; send remittance with order.

"Dental Health for the Special Child: an Optimistic Approach" The American Society of Dentistry for Children (211 East Chicago Avenue, Chicago, Illinois 60611) single copy free; $4.00/100 copies.

"Help Your Baby to a Happy Smile" National Easter Seal Society for Crippled Children and Adults (address above).

"Helping Handicapped Persons Clean Their Teeth" (A262) National Easter Seal Society for Crippled Children and Adults (address above); $.15; send remittance with order.

"Home Dental Care for the Handicapped Child" New England Developmental Disabilities Communication Center (200 Trapelo Road, Waltham, Massachusetts 02154); $1.50 per copy (videotape also available, see below).

"Home Dental Care Program" Dental Guidance Council for Cerebral Palsy (122 East 23rd Street, New York, N.Y. 10010).

"Manual of Oral Hygiene for Handicapped and Chronically Ill Patients" (SH-DH-71 10-68-15) Colorado Department of Health, Dental Health Section (4210 East 11th Avenue, Denver, Colorado 80220).

"A Preventive Care Guide for Multihandicapped Children: Dental Care Begins at Home" (L82) National Easter Seal Society for Crippled Children and Adults (address above).

"There is More to Dental Health Than Cleaning and Filling Teeth" National Association for Down's Syndrome, (628 Ashland, River Forest, Illinois 60305).

"Toothbrushing and Flossing" (E59) National Easter Seal Society for Crippled Children and Adults (address above). $1.50 per copy; send remittance with order.

"Your Handicapped Child Needs Dental Care Now" Dental Guidance Council for Cerebral Palsy (122 E. 23rd St., New York, N.Y. 10010).

Dentistry

Audiovisuals

"Dental Care for Handicapped Persons - An Important Health Issue" National Foundation of Dentistry for the Handicapped (1121 Broadway, Suite 5, Boulder, Colorado 80302) 15 minute slide/tape presentation; $75.00 or $125.00 respectively for plain or glass mount slides.

"Home Dental Care for the Handicapped Child" (no. 1930) Eunice Kennedy Shriver Center for Mental Retardation, Inc. (200 Trapelo Road, Waltham, Massachusetts 02154) 10 minute B&W $30.00 purchase; $5.00 rental; send remittance with order.

"Preventive Dental Care for the Handicapped Child" Academy of Dentistry for the Handicapped (order from VCI, Inc. 7601 Washington Avenue South, Minneapolis, Minnesota 55435) 16 1/2 minute; 16 mm film $275 purchase; 3/4" videocassette $225 purchase; send remittance with order.

"Preventive Dental Care for the Handicapped Child" Dr. Steve Blaine, (UCLA School of Dentistry, Los Angeles, California 90024); 25 minute color videotape; write for purchase agreement.

If materials are needed, one might contact this company in order to obtain toothbrushes, etc.

John O. Butler Company
540 N. Lake Shore Drive
Chicago, Illinois 60611
(312) 944-0001

Emergency Care

Emergency Medical Service, Iowa State Department of Health,
Lucas Building, Des Moines, Iowa 50319
(515) 281-4964
Contact Mr. John Menefee

"Emergency Care and Transportation of the Sick and Injured", Second Edition, Revised (Text and work-book)
The Committee on Allied Health, American Academy of Orthopedic Surgeons, 1977, George Bunta Co., Inc.